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ART. I—LOUIS NAPOLEON AS A MODEL FOR THE SOUTH.

BY WILLIAM M. BURWELL.

HIS FOREIGN POLICY.

Having thus reviewed the domestic system of the Emperor of the French, we approach his foreign policy. It will be found to rest upon the same principle, that the Empire is peace. He has made war for the necessity of carrying on his domestic policy, and that attained, he disbands his armies and puts his ships out of commission. Possibly he may have a grim pleasure in showing incidentally that England could never have conquered Napoleon without all Europe to back her. Not improbably it may be agreeable to avenge the humiliation of Paris by making the Czar eat dirt at Sebastopol. No doubt the shame of Austria and the liberation of Italy would bring him an atonement for the treachery of the Hapsburgs, and the dismemberment of France. These are incidents, however, that occur along the march of his progress. We, therefore, take up his policy with respect to

RUSSIA.

The Crimean war had been fought. It was fought to chop off the paw of the Northern bear, which was laid upon the commercial ports of Southern Europe and Asia. Russia threatened to as-

sume a position not acceptable to either of the great powers. This war avenged Napoleon the First. It not only employed two of the principal adversaries which had prostrated him to thwart and dishonor each other, but it demonstrated that England alone could not compare with France in her ability to raise large armies of her own people, or to conduct military movements upon a large scale. Who, that reads the bulletins of Sebastopol and Balaklava, believes that if England alone had met unaided France upon the field of Waterloo, she would have conquered a victory?

Russia, humbled and repulsed, retreated to her fortresses, abandoned the tempting spoil, and, profiting by the lessons of superior civilization, betook herself to copy the system which had subdued her.

The leadership of the common army, the capacity to arm, feed and fight men, and to plan the strategy of movement and action, displayed the superiority of France as a military power.

Napoleon obtained his object and made peace. He had not made war for military display alone. His campaign in Austria and his occupation of Italy teaches the same lesson.

OCCUPATION OF MEXICO.

This portion of Napoleon's foreign policy will be found of especial interest to an American. From the principles he has laid down and the directness with which he has pursued them, it does not appear probable that his object was more than the developement of French commerce. A monarch who has sustained constitutional government in Italy could not wage a foreign war to plant despotism in Mexico. Possibly his object may be explained by the fact that while his arms have been unfortunate, the trade of France with Mexico has more than trebled during the war.

ITALY.

He says to the Italian States: "You should have a nationality, one flag, one tariff, one currency. In the enlighted state of public opinion, one may be greater to-day by moral influence than by sterile conquests. I have invoked this influence by setting free one of the fairest countries in Europe. Your reception satisfies me

that you comprehend my object. I come not with a pre-determined system to dethrone sovereigns, nor to impose my will upon you. My army will occupy your country with two objects—to combat your enemies and to maintain order. It will interpose no obstacle to the avowal of your legitimate opinions."

He says, subsequently, that he sends his army to Italy to command peace. He recommends a general amnesty, the Code Napoleon, and a liberal (or progressive) government. Events recently occurring confirm the sincerity of his declarations.

MEXICO.

Speaking of the American war, the enforced [*obligee*] occupation of Mexico and Cochin China, and the insurrection against Russia in Poland as complication, [*pre-occupations*], he adds:

"How can we in effect develope our foreign commerce if, on the one hand, we renounce all influence in America, and if, on the other, France, in the presence of the vast territories occupied by the English, Spaniards and Dutch, alone remains without possessions in the seas of Asia. We have conquered in Cochin China a position which, without complicating us with the local government, allows us to develope the immense resources of those countries and to civilize them by commerce.

"In Mexico, after the unexpected resistance, which has been overcome by the courage of our soldiers and sailors, we have seen the people receive us as liberators, our efforts have not been in vain, and we will be largely repaid by our sacifices, when the destinies of the country, which will have owed to us its regeneration, shall have been entrusted to a prince whose intelligence and good qualities render him worthy of so noble a mission. Rest assured, then, that our enterprises beyond seas, undertaken to avenge our honor, will terminate by promoting our interests.

"I deplore bitterly the loss of so many brave men, but I have the consolation to believe that they will not be without use to the honor and interest of France and of civilization. Our object, you know, is not to impose upon Mexico a government unacceptable to her, nor to make our successes a triumph to either party. I wish that Mexico may be born to a new life, and that very soon, regen-

erated by a government founded on the national will, upon principles of order and progress, and upon respect for the law of nations, she will recognize by amicable relations her obligations to France, her repose and prosperity."

These extracts from his State papers explain his policy. It is made more obvious by his letter of instructions to the military and political commander of the expeditionary, General Forey:

"The object to be attained is not to impose upon the Mexicans a form of government which they dislike, but to aid them in their endeavors to establish, according to their inclinations, a government which may have some chance of stability, and which can secure to France the redress of the grievances of which she has had to complain. It is obvious that if they prefer a monarchy, it is the interest of France to support them in that view.

"There will not be wanting people who will ask you why we go to lavish men and money to found a regular government in Mexico?"

"In the present state of civilization of the world, the prosperity of America is not a matter of indifference to Europe, for it is she who feeds our manufactories and gives life to our commerce. We have an interest in the republic of the United States being useful and prosperous, but not that she should take possession of the whole Gulf of Mexico, thence command the Antilles as well as South America, and be the sole disburser of the products of the New World. We now see, by sad experience, how precarious is the fate of an industry which is reduced to seeking its chief raw material in a single market, to all the vicissitudes of which it has to submit.

"If, on the other hand, Mexico maintains her independence and the integrity of her territory; if a stable government be there consolidated, with the assistance of France, we shall have restored to the Latin race on the other side of the Atlantic all its strength and prestige; we shall have guaranteed protection to our West India colonies and to those of Spain; we shall have established our beneficent influence in the centre of America; and that influence, by presenting immense openings for our commerce, will pro-

cure us the raw materials indispensable to our industry. Mexico, thus regenerated, will always be well-disposed toward us, not only from gratitude, but also because her interests will be in harmony with ours, and because she will find a powerful support in her friendly relations with the European powers.

"At present, therefore, our military honor engaged, the necessities of our policy, the interests of our industry and commerce, all combine to make it our duty to march upon Mexico, to boldly plant our flag there, and to establish either a monarchy, if not incompatible with the national feeling, or, at all events, a government which may promise some stability."

The results of his policy may be seen in the increase, almost in the monopoly, of Mexican commerce by France, and in the adoption by Maximilian of railroads, immigration and developement. Whether the policy of occupation succeed or not, it is that alone upon which Mexico can be regenerated. The United States should succeed to this great international trust, and secure to herself the incidental advantages to result from a policy which France has introduced.

We may here digress so far as to offer an illustration of the importance of these doctrines to the Southern people. Napoleon needs the market of Mexico. Does not the United States need it much more? Is not Mexico the natural market of the United States? Cannot our national debt of $3,000,000,000 be greatly reduced by commercial developement? Are not the men of the Northwest and the South interested in opening this commerce? Cannot Southern men conduct it? Should France be allowed to increase her commerce with Mexico from 26 to 77 millions of francs, when the United States is almost altogether excluded from the same market? These are questions which rush with rapidity upon the mind. They suggest the inquiry whether a reciprocity treaty may not be made under which Tampico, Vera Cruz, Alverado, Mazatlan, Acapulco and Guaymas may trade with New Orleans and other American ports, just as Quebec and Montreal have done for years past with New York and Chicago? This subject is commended to the press, Executive and Chamber of Commerce of Louisiana.

POLICY TOWARDS THE ARABS.

In considering the foreign policy of Napoleon we naturally take up his treatment of the Arabs. His policy in this respect, is so replete with wisdom and justice towards a conquered people as to render it peculiarly worthy the observation of the government and people of the United States.

The proclamations of Napoleon addressed to the Arabs are replete with expressions of humanity, as well as the axioms worthy a great ruler.

The conquest had been in effect terminated by his predecessor. It will be seen by extracts taken from his proclamations and message how he treated that conquered people. It will be seen how far civilization confided in the sons of the desert—how monarchs speak to subjected millions.

LETTER FROM THE EMPEROR NAPOLEON TO THE MILITARY GOVERNOR OF ALGERIA.

PARIS, *Tuilleries*, Feb. 6, '63.

M. Marshal:

The Senate should very soon have proceeded to examine the general principles of the Constitution for Algeria. But, without waiting its deliberation, I have believed immediate action of the highest importance in the disquietude excited by the discussion of Arabian titles. Good faith and a regard for our own interest alike demand the performance of this duty.

"When the Restoration [of the Bourbons] made a conquest of Algiers it promised the Arabs to respect their religion and their property. These solemn engagements still exist for us, and I feel in honor bound to do for Abd-El-Kader everything just and noble which had been promised by my predecessors. Even if justice had not required, it seemed indispensable to the welfare and repose of Algeria to confirm the rights of property in the hands of those who held it. How can we possibly count on the pacification of a country when almost its whole population is disquieted about the property which it possesses? How can we hold commerce with a people when the greater part of their territory

is underrated by being debarred the right of trading or selling? How can we ever increase the resources of France when the resources of the Arabians for paying taxes is daily being diminished?"

"Let us examine the facts. There are in Algeria 3,000,000 Arabs and 200,000 Europeans, of whom 20,000 are French. These occupy an area of 40,000,000 hectars. Two millions are cultivated by natives. *The national domain is 2,690,000 hectars, of which 890,000 is fit for cultivation. 1,800,000 is in forest and* 480,000 is set apart for Europeans. The rest consists of lakes, rivers and waste lands. Upon the 420,000 hectars conceded to colonists a great part has been either sold again or rented to the Arabs by the grantees, and the remainder is very far from being in a state of profitable production.

"These figures but approximate the facts. But it is obvious that in spite of the commendable energy of the colonists, and the improvements which have been effected, European labor has been introduced but to a limited extent, and it must be a long time before a large portion of this territory will yield to their activity.

"In presence of these results it would be useless to consolidate the natives—that is to say, to confiscate a part of their lands to increase that part assigned to colonists. So it has been unanimously agreed to withdraw this project from the further consideration of the Council of State.

"We must convince the Arabs that we have not come into Algeria to oppress or despoil them, but to bring them the blessings of civilization, for the first principle of civilization is to respect the rights of every one.

"'The right'—some one will say—'is not on the side of the Arabs. The Sultan was heretofore the proprietor of all the territory, and conquest has transmitted the same right to us.' What! will France arm herself with the superannuated title of Mahometanism, to despoil the ancient owners, possessors of the soil? Upon a territory become French will she invoke the despotic rights of the Grand Turk? Any such pretension is monstrous. It would crowd all the Arabian population into the desert, and inflict upon them the fate of the Indians of North America, a result at once inhuman and impossible.

"Let us then seek some mode by which we may conciliate this proud and intelligent race, at once warriors and tillers of the earth. The laws of 1851 recognized the rights of possession and property as they existed at the date of the conquest, but these undefined rights still remained uncertain. The time has come to abandon this precarious position. The territory of the tribes, once ascertained, may be divided into donations, and this will enable the government to ascertain and allot individual property in these lands. Indisputably the masters of the soil, the natives can regulate its disposal at their discretion; and this, with the multiplicity of daily transactions with our people, will be more efficacious in bringing them to our standard of civilization than any coercive measures.

"The African territory is so extensive, the resources to be developed are so various, that any one can find occupation and give scope to his energies, according to his genius, his education or his necessities.

"The natives may raise cattle, horses and the staples natural to the soil. The activity and intelligence of the Europeans will be employed in rendering useful the forests and mines, in drainage, in irrigation, the introduction and improvement of agriculture, with the importation of those industries which accompany or precede progress. It will be the duty of the local government to take care of the general interests of the country, the development of the moral welfare of the country by education, of its physical prosperity by public works. To the same power will be left the duty of suppressing useless restrictions and of leaving to enterprise the most enlarged freedom. It will, moreover, encourage the introduction of European capital. It will not hereafter encourage the immigration and maintenance of people without means, attracted by the expectation of gratuitous homes. I have given the Governor instructions upon this subject, for I repeat—Algeria is not, properly speaking, a colony, but an Arabian kingdom. The natives, as well as the colonists, have an equal right to my protection, and I am as well Emperor of the Arabs as Emperor of the French. I have ordered a bill to be prepared, to render tribes, or portions of tribes, undoubted proprietors of the lands which they occupy, as actual occupants, or as having a traditional possession or enjoyment, whatever that may be."

To his army in Africa he says:

"In your ranks anger has never survived the battle. There has been no hatred amongst yon against a conquered people—no desire to enrich yourselves with his spoiis. You have been the first to stretch towards the erring Arabs a friendly hand, and to express the wish that they should be treated with justice and generosity; since, at last, they must become a part of the great French family.

"You have striven," he says, "against a warlike people. Associated wealth and enterprise will develop the capacity of the country. The natives, restrained and enlightened by our kind intentions, no longer disturb the tranquility of the country. Have confidence in his future. Attach yourself to the land which you cultivate as to a new country, and treat the natives among whom you live as compatriots. We ought to be masters, for we are more civilized; we ought to be generous, because we are the strongest."

PROCLAMATION TO THE ARABS, 1863.

In his proclamation to the inhabitants of Algiers he tells the French settlers that he will second their efforts and assure them protection.

"When France, twenty-six years ago, set foot upon the soil of Africa, she did not come to destroy the nationality of a people, but to set them free from a secular slavery. She has replaced the Turkish sway by a government more just, more indulgent, more enlightened. Nevertheless, during the earlier years you have made war against your liberators.

"Far from regarding this as a crime, on the contrary, I honor the warlike dignity which you have demonstrated in invoking before your submission the judgment of God. But God has spoken. Recognize, therefore, the decree of Providence, which, in its mysterious designs, often conducts us to good in thwarting our hopes and defeating our efforts.

"Twenty centuries since our ancestors, like you, resisted foreign invasion with the same courage. Nevertheless, our regeneration dates from their defeat. Possibly, as the Romans were merged in the natives, and imparted their civilization to the conquered, the Arabs may derive similar advantages from the French, and may develop that individual enterprise which once controlled the shores of the Mediterranean.

"You know my intentions. I have assured you irrevocable title to your lands. I have honored your chiefs—respected your religion. I wish to augment your welfare—make you participate more and more in the administration of your own affairs, as also in the blessings of civilization. But it must be on conditions that you respect those who represent my authority. Assure your mistaken brethren that future insurrections will be fatal to them. Two millions of Arabs cannot resist forty millions of French. For one to strive with twenty is madness. You have already taken an oath of allegiance, and your conscience and your religion alike bind you to respect it.

"You comprehend that being your sovereign I am your protector. All who live under the laws have an equal right to my solicitude. During ten years you have shared the glory of our arms. and your sons have combated worthily by the side of ours in the Crimea, in Italy, in China, in Mexico. The ties formed on the battle-field are indissoluble, and you have learned to appreciate us as friends or as enemies.

"Have confidence, then, in your destiny, since they are united with those of France, and remember, with the Koran, 'that which God directs is well directed.'"

APPLICATION TO THE SOUTH.

Such is the example thus chosen for the South. It would only remain to say that it has raised France to the first rank, if not to the first place, on the continent of Europe. It has given France a navy equal to any on the ocean, a capacity for domestic productions which gives employment to her people and wealth to her capitalists. It diffuses plenty and happiness—endears her people to their government and to their country. Her commerce overspreads the seas—her influence is first at every court. She is among the first in arts and in arms.

In the words of Louis Napoleon:

"France, without violating the rights of any person, has resumed before the world the rank to which she is entitled, and may with safety devote herself to everything of greatness which the genius of peace can produce."

Who would not feel proud to be a citizen of such a country? Who would not feel that his duty and that of his descendants were

not assured under such councils? And who would not be convinced that the independence and prosperity of all civilized countries depend upon development and progress.

Such are the truths taught by this sagacious and philanthropic man.

The South should adopt these ideas. They should copy these successful demonstrations. The South has been brought to poverty and bondage by having heretofore opposed and disparaged this system of material and moral development as a means of avoiding war by demonstrating an ability for war. They provoked war by their want of all the elements of defense.

The South has not been conquered for want of energy or capacity. The greatest agricultural values ever produced by any people for sale prove that these high qualities exist. The expansion of her race and its cardinal doctrines of civil and religious erty, from the Chesapeake to California, prove it. A war waged with inadequate means for four years against the most powerful nation demonstrate it. Let the South profit by the past. Let it profit by the lessons traced in blood, fire and fetters—lessons traced by a power which owes its ability to conquer to the employment of those agencies which the Southern States have disregarded or despised.

We must emulate the example of our Anglo-Saxon ancestors, who, though conquered by the Romans, Danes and Normans—though torn by internal dissension and often oppressed by despotic administrations, still clung to the ancient representative usages of their race, and indicated its supremacy by retaining, as the English now do, the rule of their own country and of all the races which may have made it their home, rising stronger from their fall, and copying from their conquerors the secret of their subjugation. From them we have learned this truth—the price of liberty is no eternal vigilance—it is eternal progress. The South, by falling in with the march of progress, may one day be at the head of the column. By sitting down to weep over the ruin that heroism could not avert, it will be passed or trampled under foot. Let the South, like the King of Israel, who had wept over the agonies of his dying child, arise, wash and anoint itself. It cannot return to its dead liberties, but they may come back to her desolate hearthstones. Let us have neither reproach nor repining, but earnest work, and

the march of Anglo-Saxon progress, though arrested for the moment, will be onward, strengthened by the reinforcement rather than retarded by the delay.

We should value the Union as the roof over our head; our haven after the storm—the hospital in which we will recover our exhausted strength. Let us not seek its offices or its honors. They have been the root of much of the evil which has befallen us. Napoleon has said that a nation of office-holders is a nation of beggars. Let our young men be taught that such stations here or there are but celymosynary cells in a political alms-house. Let us accept the Union frankly, faithfully, wisely. If any disturb its duration, let it be done by others than ourselves. We have now no grievances which it cannot and should not redress. The South fought in good faith—let her pledges be kept in the same spirit.

But we have more work to do than to regulate the affairs of the Union. We must leave to the government the management of its own affairs. We must maintain our own standard of honor in man and woman. We must direct, if we may not dominate, in our own land. We must invite all immigrants, but we must surpass all who come in the management of our own enterprises. Our people must be convinced, our youth educated.

When the day shall come that the country has need of the services of the South, whether in the advance of a common expansion or in the defense of some common interest, the men who met in deadly combat will march in honorable equality and in cordial friendship. Old enmities will pass away, a new national standard of fraternity and progress will be established, and the liberties of the South and the perpetuity of the Union will be eternal.

ART II.—ABOUT THE CELESTIALS.

A TALK ABOUT TEA.

We are indebted to China for the principal blessings we enjoy. Tea came from China, printing came from China, the compass came from China, and gunpowder came from China, thank Heaven! China, sir, is an old country, a very old country. There is one word we got from China, that is oftener in the mouths of American people than any other word in the language—it is the name of the small

brass coin they use, the coin with a square hole in the middle; that word we derive from the Chinese is cash, cash! And then look at our Franklin—he drew the lightning from the skies with his kite; but who invented the kite? The long-tailed Chinaman, sir. Franklin had no invention; he never would have invented a kite or a printing press. But he could use them, sir, to the best possible advantage; he had no genius, but had remarkable talent and industry. Then, we got our umbrella from China. The first man that carried an umbrella in London, in Queen Ann's reign, was followed by a mob. That was only one hundred and fifty years ago. We got the art of making porcelain from China. In 1664 the East India Company bought two pounds two ounces of tea as a present to King Charles the Second. In 1667 they imported one hundred pounds of tea. Then rose the reign of scandal, Queen Scandal. Then rose the intolerable race of waspish spinsters, who sting reputations and defame humanity over their dyspeptic cups. Then the astringent principle of the herb was communicated to the heart, and domestic troubles were brewed and fomented over the tea-table. Then the age of chivalry was over, and women grew acrid and bitter. Then the first temperance society was founded, and high duties were laid upon wines, and in consequence they distilled whiskey instead, which made matters a great deal better of course; and all the abominations, all the difficulties of domestic life, all the curses of living in a country village; the intolerant canvassing of character, reputation, piety: the mean, prying spirit; the uncharitable, defamatory, gossiping, tale-bearing, whispering, unwomanly, unchristianlike behavior of those who set themselves up for patterns, over their vile decoctions, arose with the introduction of tea. When the wine cup gave place to the tea cup, then the devil, sir, reached his culminating point. The curiosity of Eve was bad enough, but when Eve's curiosity becomes sharpened by tonics, and scandal is added to inquisitiveness, inuendo supplies the place of truth, and an imperfect digestion becomes the inspiration instead of charity. Then we must expect to see human nature villified and cheerfulness and good-fellowship condemned, and all good from Washington down, by Miss Tittle and Miss Tattle, and the Widow Blackleg, and the whole host of tea-drinking conspira-

tors against social enjoyment. Such was the diatribe uttered by Dr. Bushwhacker against the cup which Cowper commended so highly and Dr. Johnson drained for inspirations. We ventured to remark that he had spoken of tea "as a blessing" at first. "Yes, sir," responded Dr. Bushwhacker, shaking his bushy head, "that reminds one of Dr. Pangless. Yes, sir, it is a blessing, but like all other blessings it must be used temporately, or else it is a curse! China, sir, knows nothing of perspective, but she is great in pigments." Here the Doctor, dropped the oratorical and took up the historical.

"Indian ink, sir, is Chinese, so is vermillion and indigo. The malleable properties of gold, sir, were discovered by this extraordinary people; we must thank them for gold leaf. Gold is not a pigment, but roast pig is, and Charles Lamb says the origin of roast pig is Chinese; and the beautiful fabric we call silk, sir, came from the flowery nation, so did embroidery, so did the game of chess, so did fans. In fact, sir, it is difficult to say what we have not derived from the Chinese. Cotton, sir, is our great staple, but they wove and spun long staple and short staple, yellow cotton and white cotton, before Columbus sailed from the port of Palos in the Santa Maria." But, Doctor, we want a word with you about tea. A little information if you please. The Doctor is one of our old Knickerbockers. His big, bushy head is as familiar as the city hall. He belongs to the "God bless you, my dear young friend," school. He is as full of knowledge as an egg is full of meat. He knows more about China than the emperor of the Celestial people. "Tea, my young friend, is a plant that grows in China, Japan, and other parts of the world. There are two varieties—Thea Nigra and Thea Virdis—black and green tea. The same plant, sir, produces both kinds. Green tea is made by one kind of manipulation, black tea by another—that is all, sir.

"The shrub is raised from the seeds like the hazel nuts, planted in nurseries; it is set out when about a foot high; lives for fifteen or twenty years; grows sometimes as tall as Gen. Scott, and sometimes as small as Bill Seward.

"It is picked four times a year. The first picking is the best, when the leaves are covered with a whitish down. This is in April; the next is in May, the next in July, the last in August.

One Chinaman can pick about thirteen pounds of leaves per day, for which he will receive sixty cash, or six cents. The green leaves are spread out on bamboo frames to dry a little, the yellow and old defective leaves are picked out; then they take up a handful of the leaves, cast them in a heated pan, get them warmed up, and squeeze out the superfluous juice. This juice contains an acrid oil, so acrid as to irritate the hands of the workmen. Good heaven! think of that, sir, what stuff for the stomach. Then they dry them slightly in the sun, then every separate leaf is rolled up in a little ball like a shot, then they throw these green tea-shot into a pan slightly heated, stirring them up so as to warm every part alike; then they cool the tea, and the shot are picked out one by one, the best for the first or finest chop—every little ball picked over by hand. Then it is packed, sir. The young leaves make the 'Young Hyson,' the refuse goes by the name of 'Hyson Skin.' The 'Gunpowder' and 'Imperial' are teas rolled more carefully, in rounder balls, than the others. Most of these teas are colored for our market—colored, sir, with a mixture of Prussian blue and gypsum; no wonder John Chinaman calls us outside barbarians, when he knows we drink half a pound of gypsum and Prussiau blue with every hundred pounds of green tea, and this is made to order! Does honest John ever drink such tea? No, sir, he knows better than that, if he does wear a tail." And black tea, you say, is from the same plant, Doctor. "Yes, sir, Mr. Robert Fortune brought specimens of the Thea Nigra from the Bohea mountains and compared them with the Thea Viridas, and the plants were identical. The black tea, sir, is prepared in a different manner from the other. The leaves are allowed to be spread out on the bamboo trays for a considerable time, then they are thrown up in the air by the workmen, tossed about, beat, patted, until they become soft or flaccid, then tossed in heaps, allowed to lie until they begin to change color; then they are tossed in a tea-pan, roasted over a hotter fire, rolled, shaken out, exposed to the air again, turned over, partially dried, put in the pan a second time for five minutes or so, then rolled, tossed over, and tumbled again, then put in a sieve, put over the fire again three or four times, then placed in a basket, thickly packed together; the Chinaman makes a hole through the mass of leaves

with his hand to give vent to the smoke and steam; then over the fire they go, and remain there until they are perfectly dry—in fact, sir, until the fire dies out; then picked, packed and assorted for the market. Now, sir, here is the difference between black tea and green tea; the latter retains allits acrid properties, it produces nervous irritability, sleeplessness, sir; why, if you take a pinch of green tea and chew it, sir, you can sit and listen to parson N——s' sermon, and keep wide-a-wake, sir,—a thing impossible to do under any other circumstances. But black tea has much of this oil dried out of it, and therefore it is less injurious than the other; less injurious, I say, not harmless by any means. Do you ever travel in the country? Well, sir, there you will see the ravages of green tea, Prussian blue and gypsum among the fairest portions of creation—women. There, sir, you will see pinched up, pensivious, prying faces—faces made up of a complication of fine lines, as if all human sympathies had got into a tangle; necks all wrinkles; fingers, a beautiful exhibition of bones, ligaments and tendons; eyes sharp, restless, inquisitive; shoulders drooping. bust nowhere; viscera collapsed, and the muscular system, or the form divine generally, in a state of dubiety. Yes, sir, all comes from the constant use of 'thea virdis,' sir, green tea, sir. Our forefathers, sir, threw the tea overboard in Boston harbor; if people knew what we of the faculty know, sir, they would do the same thing now sir, with every drop that comes from the Celestial empire.

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ART. III.—THE SOUTHERN STATES, CANADA AND CUBA.

History will show that the war waged by the South with the Northern States was an issue to try the true meaning of a common compact, which had been left in obscurity by the agents who adopted it. The decision has been definite as to constructions to be placed on it in future, and the South has acquiesced in a division which it could not prevent. Of course, with the conquest, accrued the power to assign such motives, and bestow such appellations upon the vanquished as would stigmatise their acts.

The nickname of Rebellion has been chosen to mark this open and organized conflict of governments and of arms. History has recorded too many such results to attach any dishonor to such imputations. Extreme and exclusive fanatics may have used reciprocally the terms papist and heretic, to defame doctrines that have been avowed by the best men of all ages. The English government designated as "the great rebellion" that which we regard as a justifiable attempt to overthrow an unjust government. It subsequently described, in the same terms, our own secession by force of arms from the British Empire, as it has always spoken of the war with Scotland and the struggle of the Irish patriots, as rebellion. Coming down to the present, we find the proposition of Canada, to secede from the British Empire and establish an independent government, regarded as a question of political ethics. The struggle of the Cubans for a free, independent and representative government, is denounced as flat rebellion by the Spanish government, which owes its existence to the exercise of the same disputed right. For the purpose, therefore, of vindicating the South from all the imputations of having violated any moral or constitutional obligations, we propose to cite the example of Canada, which is even now undergoing the agitating inquiry whether it is better to establish an independent station or obtain an act of annexation to the United States. There is a very large interest in the United States which advocates a close union with the Canadas, and does not affect to conceal their wish either for its independence or annexation.

Hunt's Merchants' Magazine, an accredited organ of the commercial and financial opinions in the Northern and Eastern States, publishes, in a late number, as a leading article, an address delivered by the Hon. L. S. Huntington, Q. C., upon the Independence of Canada. We no more hold the *Magazine* responsible for these opinions than we hold ourselves bound for every sentiment expressed by our own contributors. We publish extracts from the speech only to show that what has been regarded as a heinous offense when committed by one people, has been considered good doctrine when proposed by another.

We publish extended extracts from this speech because we wish our Western and Southern readers to see the exact solution of a question which affects them greatly, and because we wish them to see that the same argument which goes to establish the propriety

of independence and annexation for Canada will apply with equal force to the independence and annexation of Cuba. We wish to see these two important territories coupled in the American mind as equally indispensable to the prosperity of the Union. If Canada is to furnish the raw material and provisions which the West now supplies the East, the West should be allowed an equivalent market in Spanish America, to re-imburse her home market lost by Canadian competition. This subject, however, we shall discuss very fully in our next number.

ON THE INDEPENDENCE OF CANADA.

Hon. Mr. Huntington repeats the substance of a speech made by him at the last session of Parliament, and says that there "is neither disloyalty nor indelicacy in bringing to public notice a subject which deeply interests this country—which has been discussed both in our own and in the British Parliament, and generally by the press in both countries—and which I firmly believe is the necessary complement of the great scheme of confederation we have accomplished. It is true that, in my humble way, I opposed that scheme in great part, because I was timid about the early assumption of sovereignty, which I thought I foresaw, then, must follow. I stated in my place in Parliament, after the coalition of '64, that confederation, if it should really prove what its promoters pretended—an antidote to annexation—was the first step toward the independence of the country. But opposition was useless, for confederation was the policy of the empire; and imperial influence is always too powerful for colonial dissent. I have accepted the situation in its fullest sense, as faithfully and loyally as if I originally promoted it But the first step having been taken, I see dangers in delay, and I believe it is expedient to take measures for the severance of our present relations to the empire. This is a momentous step, and requires grave consideration. It must create difference of opinion, and the broadest tolerance should be accorded to discussion. I propose to speak candidly and dispassionately. I have no party battle to fight, nor personal preferences to gratify. Holding strong opinions as to the future of this country, I submit them frankly for the verdict of my countrymen. Sooner or later the weight of opinion—the majority—must rule. I am prepared to accept the decision, and loyally abide by its consequences. Such

service as I can render will be cheerfully rendered, whether my country remains a province or becomes an independent state. And I profess and feel profound respect for those who honestly dread the great change we are discussing.

ARGUMENT FOR COLONIAL NATIONALITY.

"Foremost among the barriers to our progress towarda nationality is that noble sentiment of loyalty to the British crown, which has so generally and so happily subsisted among the great masses of our people. Can we forget our noble Queen? Can we dissociate ourselves from the glories and traditions of the empire? British citizenship is no idle word, and what could we create for ourselves to surpass it? For a century past the affectionate colonial eye has rested from afar upon the British throne, as the centre of power, protection and glory. We have venerated the old land, with a far off colonial adoration; we have borrowed her thoughts, leaned upon her opinion, and, conscious of the plentitude of her effulgence, we have been proud to shine through her reflected light. England has been the land of our dreams; even distance lent her enchantment, and Englishmen to us were a superior race. We have been proud of the old flag; not, indeed, feeling under it an equality with the sea kings, but assured of its protection, in the listless life of dependence which colonists lead. We knew, if great danger should threaten, that flag would float over us, stayed by an arm stronger than ours, which we could not control; and that ours would be neither the duty or glory of upholding it. But dependence begets trust; and to confide in a generous people is to admire and love them. Can all this trustfulness, this affection and loyalty be torn ruthlessly away? It deserves, at least, respect and tender treatment. But it might not be wise to jeopardize the great future of our young country, for the sake of even so noble a sentiment, as the Hindoo widow sacrificed her life upon the funeral pile. Governments in our time are ordained for the prosperity of the people, and, if it can be shown that the virtue of self-reliance and national manhood—habits of original thought—a condition of equality with the nations of the earth—an immense preponderance of material advantage—may be safely and permanently secured by

a friendly change in our relations to the empire, perhaps loyalty to the Dominion might come to overshadow the wide-spread sentiment of loyalty to the crown. The child nestles with fond dependence to the parental heart; one by one his habits of sel -confidence are acquired, as childhood merges into youth or manhood approaches. When at last the age of majority is reached, filial affection is not quenched, because the days of dependence are over. Nor could we plead the tenderness of the tie as an excuse for perpetual childhood. It is from such a point of view that the London *Times* speaks of Canada as ' The eldest son of England."

" But there are those who believe that the independence of Canada would conflict with the Colonial policy of the Empire, and who, taking their inspirations from the traditions of the past, make England's glory to consist in the vastness of her colonial possessions. The motto of " Ships, Colonies and Commerce " belongs to an age that is past. Its mention summons the ghost of the old Act of Navigation and the celebrated twenty-nine acts of Parliament for the maintenance of a Commercial Monopoly—" like melancholy ghosts of dead renown." It was a system of obstruction and restriction to Colonial enterprise, in which the colonists were regarded as mere contributors to the wealth and glory of the parent State. Freedom has made rapid strides in England since those days, political economy has been remodeled, and political arithmetic has achieved new systems of calculation. England did not find that the loss of her original American colonies dwarfed her industries, crippled her commerce, or blighted her prestige as a nation. They have grown to be a greater people and more profitable customers. The young Colonies, relieved from the restraints of tutelage, espoused great principles and upheld them, thus ensuring their own greatness, and, incidentally, the elevation of universal mankind. Englishmen have watched with a careful eye the progress of their kinsmen in the untried field of freedom and equality. Slowly and cautiously they have copied what seemed to be success and have been warned of the distinctions between liberty and license; and thus for nearly a century the two great nations, foremost in their devotions to the principles of popular freedom and constitutional government, have been a constant example and en-

couragement to each other. Sometimes there have been rivalries and estrangement. Quarrels among kinsmen are oftenest bitter and unreasonable, but the friends of peace and freedom have trusted, not in vain, to that palladium of common principles, which both people have cherished; and thus it has happened that the dismemberment of the Empire, which the matchless eloquence of Chatham and Burke foretold and deprecated, and honest old George the Third believed impossible, has proved a great commercial and political blessing to England and the world. The old motto meant after all nothing more than "Ships, market and commerce, and these, under the new relations of the colonies, have been multiplied a hundred fold.

"Now let us, like men of nerve and comprehension, apply this lesson to ourselves. What benefit are we to England? From what we have seen it is manifest that our sovereign independence would enhance our own growth and resources, and multiply the advantages she could derive from our trade. The commercial argument, therefore, from an English point of view, is against the connection, and this is why our enemies affect to despise it. But how are we otherwise useful? Are we a source of strength to her in war? Do we recruit her armies, or, foiling to supply men, do we pour our means into her military coffers? We do not even afford a field for the political patronage of the British administration of the day, and there remains to England, therefore, but the doubtful prestiges of nominal rule over vast American possessions. What wonder that Englishmen are growing cold to this advantage, when they reflect upon the prodigality of blood and treasure it may one day cost them to maintain it. Faithful to her glorious traditions, England will act no dishonorable part towards us while we remain a portion of the empire. Her oft-reiterated promise to defend us in case of war, she will fulfill with the last man and her last dollar. But the obligation is not the less an embarrassment because it is binding. And the more far-seeing of her statesmen, for about fifty years, have looked towards a change of the conditions which imposed it. Step by step, in all the noble and unprecedented concessions they have accorded to us, we have been led cautiously towards the paths of manhood and self-reliance; and they have

explained to the British people, as they watched this problem of a free government growing out of their colonial jurisdiction, that the Colonial state was not what Burke called it, a "perpetual minority," but must expand into sovereign and independent powers. In the great Confederation debate of '65, the Hon. John Hilliard Cameron, the leader of the High Tories in Upper Canada, declared, in denouncing the doctrines of the Manchester school, that Canada derives no important benefits from her connection with Great Britain, except in the matter of defense.

SEPARATION DISCUSSED.

"With this honest declaration of an untainted Conservative chief, I propose to open a brief discussion of the question. What benefit is England to Canada? I speak as to the future, and I am not unmindful of her generosity in the past, and the great heritage of free institutions she has bequeathed to us. These were our birthright, but a less magnanimous provincial policy would have denied them to us as colonists. Sovereign or dependent, Canada will cherish for all time a grateful memory of England's gentle and benignant rule over us, while she taught us the lessons of constitutional government. For all time, too, wherever our great populations are descended from her noble stock, we shall cherish the pride of kindred, shall claim our share in the glories of her literature, her martial powers, and her commercial triumphs. But these rights are not to us an exclusive heritage, and we but hold them in common with the descendants, all over the world, of the great Foster-mother of nations; and I am enquiring after the special advantages of the connection. These are not to be found in our commercial intercourse, for here we are left to compete against the world. It is not that her abundant capital, attracted by our loyalty and affection, flows in upon us because we are a dependency; to develop our resources, and to awaken the hum of industry along our shores; for that capital seeks only a safe return of its investments, and is oftener drawn where it is better rewarded among strangers. It is not that the prestige of the connection gives us a position among the people of the earth; for our powers are merely local and municipal, and bear the taint of inferiority and dependence. There remains, therefore, but the one advantage, and we end, as Mr. Cameron began for us,—the advantage of the connection is nar-

rowed to the solitary matter of defence; and we shall see, as we proceed, that even this is of doubtful utility. Defence presupposes attack, which we have only to dread from our republican neighbors. But the difficulties with them are always of an imperial character. The Trent affair, the Alabama claims, and the Irish Fenian quarrel with England, were all as foreign to us as the China Seas, and interested us only in their consequences. It is not true that the same may be said of Liverpool or Dublin for a hundred reasons: but especially because they are part of the British Isles, and are represented in the British parliament. We have no voice and cannot influence the foreign policy of the empire. There is only for us the duty of waiting till war is declared, and the luxury of becoming the field of blood, the theatre of desolation. Thus England would defend us, but from what, but the consequences of her own quarrels? We have no occasion for dangerous controversy with our neighbors on our own account. Our interests are blended with theirs, and tend to mutual comity and good will, and the dangers of conflict will be a thousand fold removed when British entanglements are avoided. This fact has been again and again admitted by British statesmen. During the debate in the House of Commons on the defences in 1865, Mr. S. Fitzgerald declared, that if Canada were independent, there would be no cause of quarrel between her and the United States. That it could be only through a desire to strike at England that America would attack us. Canadians had not permitted the Alabama to escape or precipitately acknowledged belligerent rights, and there could be no cause of quarrel, except that she was united to England; and his belief was, that if Canada were independent to-morrow, she would not run the slightest danger of a contest. Mr. Cardwell adverted to that speech as one against whose tone the Government could make no complaint, and the sentiment was received with the approving hear-hears of the House. In the same debate Mr. Bright, whose views have not changed, and who is a power in England at this moment, declared, that should any occasion to defend us arise, it would not result from anything done by us, but would be a war growing out of the relations between the Cabinets of London and Washington.

"It is true that in case of war, we would be no match for the power of our neighbors. But our dependence would be in the righ and in the comity of nations. There is no reason to fear that they

would be agressive. Mexico, Cuba, the South American States have maintained their autonomy without molestation. And besides, as Mr. Cameron suggested the other day, there would probably be little difficulty in arranging for a British and American protectorate.

"It is to be regretted, of course, that a portion of the American press adopt a disagreeable and sensational tone upon this subject, and it suits the views of certain journals here to give these utterances an unnecessary prominence. They preach, of course, the manifest destiny of annexation, and they laugh at our independence, as impossible of maintenance for six months after its achievement. They say it is impossible for two people of the same race and language to live alongside, without the absorption of the smaller by the greater. This is mere vapid assertion. The experiment, of course, was never tried, because the prescribed conditions were wanting. But what did these people preach about the Southern Confederacy? Did they not prate loudly of her power to sustain a national existence? And though she failed, after prodigies of valor and skill, what reasonable man doubts that, could she have achieved her independenc, she might subsequently have maintained it? Yet the South was far behind us in her appreciation of freedom and the true elements of a nation's greatness. * * *

"I have said that independence is the natural sequence of the theories which promoted confederation.

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"Adam Smith wrote that no dominant country could ever voluntarily relinquish its power over a dependency. But he regarded the abandonment in the light of a sacrifice, and in our case, England has already abandoned all the patronage which, in his view, was a temptation to retain dominant power. But Mr. Cornwall Lewis, who wrote later, and after modern collonial views began to permeate England, regarded as probable that a parent state, deriving no advantage from a dependency, and believing that the dependency was able and willing to form an independent state, might abandon its authority for the want of a sufficient inducement to retain it. There might even be positive reasons for a withdrawal, as if the dependency contributes nothing to the commercial facilities of the dominant country, it is a source of expense to the supreme government, and may involve the dominant country in war; and he further says that if the parent state understands its true re-

lation to the dependency it will voluntarily recognize independence when there is fitness to maintain it; will prepare those for independence who are still unable to stand alone; and will seek rather to promote its trade, than its Empire. Englishmen believe that we are capable to fulfill all these conditions and they are cautiously but persistently pressing the responsibility upon us. Need we hesitate to take the hint and prepare to assume it? Are our public men too timid to lead the people up to the great work which is before them? Are they blind to the signs of the times or are they seeking to encourage the people in blindness? It is time that every Canadian should comprehend the attitude which England is assuming; and that he should calmly and dispassionately admit there is method in the madness she is accused of. We have seen that in a commercial sense or in a sense of military or national *prestige*, she derives no advantage from the connection. We have seen, that there is mutual disadvantage—unmistakable danger to the mother and the child, in the relations subsisting between them. How long can we afford to cultivate blindness to our true position, and go on simulating an importance which is deceitful and visionary. The change must come and it is only manful to prepare for it. It is childish to underate ourselves or the duties that await us. There are dangers in delay, and it is our duty to face the grave aspect of the position. As we have seen, the interest and the policy of the Imperial Government are unmistakable. Tory and Radical seem for once in accord. No doubt the responsibility of ministers in England, the delicacies of party relations, the anxiety of one side to retain office and of the other side to obtain it, may temper imperial tactics and stimulate caution and reserve. It may be that even yet a skillful appeal to the dead past of the old colonial policy might rouse a spirit of resistance among the British masses. There may be some who still believe that the perpetual minority of the Colonies is essential to the glory of the Empire; as there are still some who cherish the traditionary faith that one Englishman can whip two Frenchmen. This state of things may delay, but it cannot avert the crisis. There remains still the Colonial Policy—the unmistakeable hand writing on the wall. Even Sir John Young our chief Imperial officer, an able, astute, and experienced statesman, has not found it consistent with his high duties to be reticent upon this great question of the hour. Cautiously of course, as became high his office, but significantly as the representative of great

Imperial interests here, he hints at the transition State, through which our institutions are passing. He stated at Quebec and reiterated at Halifax, that Canadian statesmen and people are the best judges of their own interests; that their destinies were in their own hands, and that if they decided upon some change, the proposition would receive from the statesmen and people of England a generous and friendly consideration. His Excellency does not belong to that school of thinkers, who preach that pending the great consolidation here, further changes are not to be thought of. He does not tell us that, because Confederation is half accomplished, we should shut our eyes to the future, and leave blind chance to accomplish the destinies of this Great Northern Dominion. He tells us indeed, in his Halifax speech, that he had been misrepresented at Quebec, and that he had been made to talk of change of allegiance, when he only meant change of alliance. Nobody but the wilfully blind could have understood His Excellency otherwise.—Nobody could have dreamed that a British Governor would suggest to the people of half a continent under his rule the cession of their territory to a foreign power. But His Excellency is too good a philiologist not to understand the full purport of the words he discusses. *Allegiance signifies the obligation of a subject to his prince or government; alliance suggests original powers mutually exercised by the parties to a compact, and practically, therefore, allegiance ceases when alliance begins;* and this view is quite consistent with Sir John Young's able speeches, as interpreted by himself. He simply did not intend to convey the idea that England would promote the annexation of this great country to the vast territories of our republican neighbors, while at the same time he felt that the future had something nobler in store for us than the mere colonial tutelage of our times. Hence he spoke of change from such a state, encouraged by us, by reciting the example of Holland, with smaller territory and fewer resources, and cheered us with the promise of the perpetual good will of his government and "alliance" with England, the "mother of nations." The country owes a debt of gratitude to His Excellency for this timely aid to the popular thought, for thus cautiously foreshadowing that brilliant future, whose effulgence has dazzled his timid ministers. It is, moreover, stated, upon what seems to be undoubted authority, that when it was intimated to Sir A. T. Galt that Her Majesty had it in contemplation,

in view of his distinguished public services, to confer upon him the honor of knighthood, that gentleman took occasion to lay before the Executive a statement expressing his high sense of this great honor, but that he felt he ought, before accepting it, to represent the strong views he entertained in favor of the early independence of this country.

ENGLAND PREPARED FOR SEPARATION.

"In that great debate, from which I have quoted on the defences of this country, Mr. Disraeli alluded to the hypothesis of a desire on the part of Canada and the North American Colonies for independence; and to the hour when England might thus lose a depén dency, but gain a firm ally and friend. And again, he said Canada has its its own future before it. We have a right to assume it. It has all the elements which make a great nation. It has at this moment a strong development of nationality, and the full conviction on the part of England that these provinces may ultimately become an independent country is to her, not a source of mortification, but of pride. Mr. Bright, in the same debate, points out the reason why Canadians should feel, if they are like other Englishmen, that it would be better for their country to be disentangled from the politics of England, and to assume the position of an independent state. He believed, from what had been stated by official gentlemen in the present government, and in previous governments, that there was no objection to the independence of Canada whenever Canada might wish it. If Canada, by a friendly separation, became an independent state, said Mr. Bright, choosing its own form of government—monarchical, if it liked a monarchy, or republican, if it preferred a republic, it would not be less friendly to England. And, in case of war, Canada would then be a neutral country, and her population enjoy greater security. In the same debate Lord Palmerston declared that when the Provinces felt strong enough to stand alone, and desired the connection no longer, England would say, "God speed you and give you the means to maintain yourselves as a nation." These general sentiments of the debate provoked no dissent in the House, where all shades of British opinion are represented. And though nobody declared the time had come, England was manifestly shaping her policy to meet it.

"The London *Times*, by the last steamer, contains a circular from a meeting of colonists in London, expressing alarm at the new imperial views of the colonial relations, and seeking to provide means of inducing the British Government to withdraw from its lately declared policy on the subject of colonial defence; or failing in that, to demand to be released from their allegiance, and to adopt such further means as the exigencies of the new situation may require. The circular suggests a conference in London during the next session of the imperial Parliament of delegates from all the colonial governments, and the *Times* vouches for the importance of the movement, which it regards as an epoch by the tone in which it discusses the whole question. That journal, the most delicate thermometer of influential opinion in England, argues that the remonstrances will be fruitless, and warns the colonies to rely on their own independence. From all this it appears that the attitude of England is sufficiently pronounced and comprehensible, and one of its effects will be powerfully to modify and ripen colonial opinion. At first, no doubt, among our own people, we may witness bewilderment and surprise. Some will make it a pretext to advance preconceived opinions, and others may at first turn from it in disgust; but in the end the sober second thought of our countrymen, if the opportunity is afforded them, will grapple with the subject in a patriotic spirit and with a fair reference to its bearing upon the interests of both countries. * * *

Is it not, then, the duty of our political teachers to cultivate our opinions, to enlighten us and to prepare us for our duties in whatever awaits us, rather than to silence our inquiries and leave us to drift in the dangerous currents of uncultivated speculations?

ARGUMENT ON ANNEXATION.

"The great commercial want of this country is a profitable market for the surplus products of our industry. It was the theory of confederation to supply this want by opening up to us the markets of the sister provinces. I am afraid the results have not thus far greatly increased our scanty manufactures. Our natural market is the American, and we do, and shall suffer, till we gain access to it. Nor would a mere temporary treaty, subject to the caprices of politicians and entangled with the embarrassments of British foreign diplomacy, afford a full remedy. Manufactures and commerce prosper under permanent as well as liberal tariff arrangements,

and it is in vain that you treat them with generosity to-day if there is apprehension that you may cramp them to-morrow. We require markets; but to confer their full benefits they must be permanent, so that capital may acquire confidence and seek permanent investments here. Without this state of things our trade must be limited and manufactures remain exotics among us; and, the exodus of our population remaining about equal to its normal increase, the promise of progress is not cheering. We ought to be manufacturers for this continent, with our cheap labor, cheap living and wonderful natural facilities. We cannot compete against the distance, the skill, the capital and teeming labor of the Old World, and there remains for us but the comparatively petty business of supplying our own sparse populations in unhealthy competition with the great manufacturing industries of England and America; and it often happens in time of depression, when our struggling manufactures most need encouragement and support, that we are made a sacrifice market for those great countries, to the ruin of our home trade Our agriculture is confined to our own markets, or leeched and crippled by the exorbitant exactions of the American Customs collectors. The development of our mines, too, is prevented by like inhospitable exactions, and we are depleted and impoverished by a paper wall of legislative prohibitions, built along an imaginary line. In this strait it is cold comfort to assure us that the neighboring trade suffers equally with their own; a fact, nevertheless, modified by this difference—that the aggregate of their commerce is so much greater than ours. It would be idle to doubt that these influences have contributed to produce the present languishing trade and universal depression. The Canada *Gazette* affords the spectacle of forty insolvents in one week; and the unfortunate list stretches back for months past in alarming proportions. The emigration of common laborers to the States is something actually alarming; and it could not be otherwise, for our water powers are neglected, our mines are closed, and we have no means of furnishing employment to our people. Some wise statesman has been understood to exult over the fact that many of these poor people go away with the hope of returning; but it is a sad commentary on our hopes for the future if there are to be no means to remove the stern necessity, the hopeless poverty and want of employment, which drives them, unwilling, away. We are told that depression

prevails in the States, which is true; but the manufactures are established there, and even the limited production goes on, the markets are supplied, and the poor laborer is employed and paid. * *

"We must have free and assured commercial intercourse with the States, and they need it as well as ourselves: I shall be told these theories lead to annexation; and it is true that, so far as our embarrassments relate to commercial intercourse, annexation would supply a remedy. But would it be the best remedy? I think not; and even if it were otherwise, would it be desirable or possible of achievement? I shall speak of this later on. But mine is another scheme, and, I think, a better one, for a system of continental trade. I would banish the Custom House along the frontier; but I would preserve the imaginary line, as a broad division between two friendly nations, who desire, while maintaining free intercourse, to maintain their autonomy—to work out their own destiny and develop their own free institutions. Before the formation of the Zollverein by treaty stipulations, the commercial intercourse of the several German States was hampered by disabilities and restrictions similar to those which prevail between us and our neighbors at this moment. The introduction of merchandise from one State to another was not permitted without the payment of duties. In addition to this, numerous prohibitions existed, and the trade relations between the contiguous sovereignties were fettered by oppressive and vexatious restrictions. But the inconvenience became manifest and intolerable, and the German States, while retaining their autonomy, introduced a wiser commercial policy. They removed those unnecessary burdens which only tended to clog enterprise and choke the channels of legitimate trade between contiguous states. They adopted one consolidated government for commercial purposes, one line of customs on he geographical boundaries was established—one tariff, export tand transit, was enforced for all, and the revenue thus acquired was distributed among the members of the confederation in proportion to the population of each. This system for a long series of years has given satisfaction in Germany, and it is conceivable that Canada and the United States might adopt something akin to it with mutual and permanent advantage. This would be preferable to any reciprocity treaty, because it would be absolute and permanent free trade between the two countries. It is preferable again, because

it could be more easily obtained, and would indeed be a favorite arrangement with the Americans. It would save both parties immense expense along their frontier, and would disband a vast army of smugglers. It might be effected in six months, and while it would be equally advantageous to our neighbors, it would make Canada a great agricultural, mining and manufacturing country. It would be popular in the United States, because it would please the free trader, and Mr. Greely, the great protectionist, has promised us his support. It would settle the Fisheries and give them the free navigation of the St. Lawrence, and it would open half a Continent to their enterprise and capital. It would give us access to the markets of 40,000,000 of people. It would attract to us unlimited capital, and our country would be dotted with numerous mining and manufacturing villages. Our agricultural and commercial interests would multiply and expand in proportion. Our people would be employed at home, and multitudes of foreign laborers would be attracted from abroad. Happiness and contentment would walk hand and hand with the prosperity of our countrymen. You like the picture, but alas! it has awkward shades; and it is set in an ugly frame. We can't negociate such a treaty. Canada has great interests, but she has no power. She can exercise no diplomatic functions, because she has no recognized foreign relations.

"There is but one logical remedy, and that brings me again to the same conclusion—*a separation from the parent State.* Independent, we might accomplish this commercial advantage. Independent, we might take the staff in our own hands. We should have foreign relations. We could negociate treaties. There is a class of people among us—I believe they are not numerous though the uncertainties of the times are calculated to increase them—who are impatient of half measures, and who desire immediate annexation to the States. To such people I say, what advantages would you derive that the Zollverein would not afford you? Surely you do not prefer the system of our neighbors to our own British responsible system of government. You are not unmindful of the elevation which national hopes and aspirations would impart to our people. Why not join us, and work out that system, under improved conditions, on this continent? England would gladly consent to our independence, and aid us with the perpetual alliance her statesmen have promised. But could she, without loss of pres-

tige and honor, consent to the alienation of half a continent, and its cession to a foreign power? You only complicate the situation by your impracticable demands. You furnish weapons to the enemy, and you do not serve your own views. If Canada is ever separated from England, it will be at the cannon's mouth, if it be not to establish her sovereign independence. It is better for America, and better for ourselves, that the Dominion should remain autonomous. There is a powerful party here who represent the United States as overbearing and aggressive. They believe that the inauguration of a Commercial Zollverein would be followed by overt acts for our subjection. I believe this statement is unfounded. I have no doubt that judicious negociations might speedily remove the danger of it, by the guarantee of our statues, through the means of a treaty of amity with us between the United States and England; and I have no doubt that early steps should be taken to secure it. But I dont believe it is fair to assert that the Americans are an aggressive people. They are, as a nation, wedded to the arts of peace. Sometimes filibusters have departed from their shores, but they have never succeeded, and they have never been encouraged by their government. As I have already said, Mexico, Cuba and the Spanish American States have never suffered from an American spirit of conquest. True, there was a war with Mexico, but with that nation at her feet, the Americans refused her subjugation. With less cause France invaded that country, and attempted to monopolize her government. England, by a happy accident, escaped.

THE MONROE DOCTRINE.

"But I shall be told that the Monroe doctrine contemplates the unqualified subjugation of the continent, and that the Americans preach that doctrine, as Peter the Hermit preached the Crusades. So much has been said of the monstrosities of that doctrine—so many excellent old ladies have been alarmed by it—that perhaps we may profitably inquire what it was, and whether we should really regard it as a standing menace to us and our children? It will, perhaps, startle some people to be told that this doctrine was essentially of British origin, and that it was suggested by Mr. Canning. France had put down the constitutional principles which prevailed in Spain, and entertained the notion of defraying her expenses by acquiring Spanish colonies in South America, and Eng-

land, indignant at conduct so detrimental to her interests, and with the aversion which Mr. Canning had ever shown to the Holy Alliance, induced President Monroe to enunciate the doctrine which has since become so famous. The following quotation from the late edition of the *Encyclopædia Brittanica* will explain what that doctrine really was:

"'James Monroe succeeded Madison in the Presidency, and retained it eight years (1817 to 1825). Towards the close of his administration (1823), in compliance with the suggestion of his Secretary of State, John Quincy Adams, he introduced into his message to Congress—adverting to the purpose of the European allies of Spain to assist her in subjugating her revolted colonies in Central and South America—the assertion of a principle in which the rights and interests of the United States are involved, that the American continents, by the free and independent positions which they have assumed and maintained, are henceforth not to be considered as subjects for future colonization by any European power. * * * * "'With the existing colonies or dependencies of any European power,' continues the messages, 'we have not interfered, and shall not interfere. But with the governments who have declared their independence and maintained it, and whose independence we have on great consideration and on just principles acknowledged, we could not view any interposition for the purpose of oppressing them, or of controlling by any other manner their destiny by any European power in any other light than as the manifestation of an unfriendly disposition towards the United States.'

Congress took no action upon this; but the spirit of that body, and of the nation was in favor of the Monroe doctrine. Lord Brougham, in reference to the President's declaration, stated that it had diffused joy over all free men in Europe; and Sir J. Mac-Intosh spoke of it in the following terms:

"'This wise government, in grave but determined language, and with that reasonable and deliberate tone which becomes true courage, proclaims the principles of her policy, and makes known the cases in which the care of her own safety will compel her to take up arms for the defense of other States. I have already observed its coincidence with the declaration of England, which, indeed, is perfect, if allowance be made for the deeper, or at least more immediate interest in the independence of South America, which near

neighborhood gives to the United States. "This coincidence of the two great English commonwealths—for so I delight to call them, and I heartily pray that they may be for ever united in the cause of justice and liberty—cannot be contemplated without the utmost pleasure by every enlightened citizen of the world.

"Thus it will be seen that the real Monroe doctrine differs entirely from the popular version of it; that it was suggested and heartily endorsed by England, and that it conveys no warning or menace to us. I entertain no doubt that the American government and people would promote, by all convenient means, the independence of this country, and the intimate commercial relations I have suggested, and as will have been seen, my doubts are as few, that England would encourage the arrangement and promote it to every reasonable extent. But even if improved trade relations with our neighbors were impossible, the safest way out of our commercial difficulties is to throw off the restraints of the colonial state. It is conceivable that the tide of European emigration might, to some extent, be diverted from the American States to our own rich and extensive valleys of the Northwest, but for the European prejudice against dependent States; and especially the Irish prejudice against British sovereignty. Disguise it as we may, these are serious drawbacks to our immigration policy, and account in some measure for its practical failure. With the Northwest peopled, and with facilities of access to it, an important market will be opened to us, and a corresponding growth of our manufactures will follow. And as we have already seen, independence would contribute to the establishment of an assured and permanent commercial policy, without which, capital will continue to distrust us, and refuse to play its legitimate part in the development of our resources. Independence, moreover, would create among us that spirit of self-confidence and enterprise which prevails so largely among our neighbors, which has contributed so much to their greatness, and which grew out of the national independence they established.

"This is a great scheme, and your destinies are interwoven with it. I have touched upon its general features; you can do the filling up at your leisure, if you do me the honor to reflect upon what I have told you. We have seen that the subject is ripe for discussion, and that our vital interests are involved. We have seen that England is embarrassed by her relations to her dependencies here, and that Canada is crippled by the restrictions of the connection.

We have seen how our noblest sentiments of loyalty to the crown may be merged and intensified into loyalty to the Dominion; and how a spirit of national patriotism is indispensable to our growth in enterprise and self-reliance. We have seen how the removal of Imperial tutelage paved the way for the growth and expansion of the older North American colonies; and how rapidly, while administering their own resources, they rose into greatness and power. And we have seen how England was immensely the gainer by this providential change of her relationship to them. I have shown how we might profit by their example—not through revolt and bloodshed—for we find England offering us the boon of independence, which she denied to them, and thus the way is made easy, through peaceful paths, for the accomplishment of our nationality. I have shown that the proposed state is but a second and necessary step in the great drama of confederation, and that it indicates no revolution, no violent distortion of our institutions. I have shown that England desires the change, and that we need it; and that it would happily solve for us great commercial and political problems. I have shown how it might lead to the cultivation of amity between ourselves and our neighbors—how it must tolerate the separate independence of each, while it embraces the widest freedom of commercial relations. I have warned the impetuous reformers, who would prize beyond all this political alliance, that annexation is impossible, and the agitation for it an embarrassment; and I have predicted that the Americans will be content with this change, so important and so easy of achievement; and which, unlike its alternative, annexation, involves no humiliation to England. I have shown how the vast territories, the important population and immense resources of this Dominion entitle it to a respectable place among the leading nationalities of the earth, and I have rebuked the critics who sneer at such aspirations, decry our abilities and prophecy our humiliation and defeat. It may be all a dream, but it is a vision of a great future of wealth and happiness, of power and glory for our country. And it is a vision which foretells a fact, and will ere long expand into the regions of substantial reality.

"It might happen that, as with Confederation, our politicians will give us a system, ready made, without troubling the people for

opinions, yet the subject has engaged some preliminary attention. The significant fact is stated that during the negotiations about the Confederation act in England, Sir John A. McDonald advocated the adoption of the word Kingdom instead of Dominion of Canada. And it is well known that a Canadian monarchy was one of the dreams of the late Mr. D'Arcy McGee, administered by an English prince and dignified by a local nobility. And the able organs of the hierarchy of Lower Canada, who have cautiously written in favor of independence, are understood to favor similar views. On the other hand, there will be found those who dread the expenses of royalty, and who doubt the feasibility of ingrafting feudal forms and pageantry upon the democratic institutions of the new world. Such people see no charms in the extravagance of a court and the re-enactment of the laws of primogeniture for the maintenance of a privileged class. They will tell you that a system which failed in Mexico, with France at its back, cannot prevail here among the levelling influences of free institutions. But you and I may await the current of events, and prepare for the discussion in due season. It is well for those who agree as to the end to be achieved to agree also upon the postponement of disturbing collateral issues. We shall find for a time yet a fierce party to fight, composed of those numerous and powerful interests which depend upon the maintenance of things as they are; and embracing as well, no doubt, a large element of disinterested loyalty and honest devotion to the country. I proposed at the outset to speak from no party point of view. My theme is exalted above and beyond the divisions of party; and, barring personal bitterness, my position has been assailed as fiercely by my friends as by my enemies. But this is not the occasion for recrimination or reply. My dependence is upon the completeness of my argument. I have strong views as a party man, but they have no place in this discussion. I might cross the House to-morrow, if I found my enemies adopting these views, and if my friends should persist in opposing them. There is a grave responsibility resting upon our public men. The country is adrift and the public mind is disquieted. Everybody believes the finality is not reached, and asks, whither are we drifting? Some suspect that the administration hold peculiar views,

but they neither venture to deny nor proclaim them. When I had the honor first to express these opinions on the floor of Parliament, ministers treated me to some personal abuse, but upon the main question they were cautious and silent. There was a profound impression through the House, but they ventured upon no word of disavowal. Their opinions were shadowed in mystery, and they had not the courage to proclaim them. Afterwards when this strange phase of the debate had provoked some comments from the press, Sir George Cartier did indulge in a gentle dissent from my conclusions. Nobody denies that a change must come, and there remains only the question of time and fitness and preparation.

"Sometimes it requires boldness to speak the truth, but there is no power to stifle free discussion in this country. You and I have a right to our opinions, and the right to discuss them. The statesmen of England have set us the example in the very citadel of the empire. There is no political disability here, for the councils of the nation are presided over to-day by men, some of whom lately sought to subvert the government, and others to promote its immediate annexation. They are loyal citizens now, and so are we. Time changes conditions and works marvels, and time will accomplish the great destinies of this country, and, let us hope, in a manner most conducive to the happiness of its people."

ART. IV.—DEMOCRATIC CONSERVATIVE PROPOSITIONS.

FOR THE CONSIDERATION OF THE LEGISLATURES AND THE PEOPLE OF ALL THE STATES!

1. The political doctrine enunciated in the declaration of our national independence, "that all men are created equal," asserts their political equality.

2. The political equality of all men is not confined to individuals; but all the races of men are "created equal," and are "endowed by their Creator with certain inalienable rights," the chief among which is the exclusive right of each race to govern its own country.

3. According to the principle of the political equality of all men, and of all races of men, the white race in the United States of America is entitled to the exclusive right to govern its own country.

4. In fact, and in law, the whole territory of the United States of America has always belonged to the white race constituting its people, and is their country, and can neither directly nor indirectly, nor in any proportion, be alienated from them by any legislation whatever.

5. While the political and other rights of humanity, as defined by man, are equal, humanity itself, the creation of God, like all his works—from the sands on the sea shore to the stars in the firmament—is subject to infinite diversity, being composed of various moral, intellectual and physical elements, differently compounded in every individual, and even in the same individual in each successive instant of time.

6. From immemorial times, according to the general analogy of nature, which compounds its elements in constant proportions, and thereby produces fixed classes of all animated and inanimate beings in the whole animal, vegetable and mineral world, classes of men have existed, endowed with moral and intellectual elements, combined in certain constant proportions, outwardly manifested in unchanging political and religious institutions, namely: in centralized political power or despotism, caste or aristocracy, slavery, polygamy and idolatry—as always seen, for instance, in Egypt, India and China—which classes of men have transmitted their moral and intellectual endowments, in unchanged proportions, through thousands of years, to their posterity, as shown by their unvaried maintenance of these institutions down to our day.

7. The classes of men, or races, who, from immemorial times, have cherished and handed down, from father to son, the distinctly marked political and religious institutions of centralized political power or despotism, caste or aristocracy, slavery, polygamy and idolatry, have all been distinguished from the white race by possessing a dark colored skin—black, brown, yellow, red, or of some shade or admixture of these colors, together with other less striking, though equally constant, physical peculiarities.

8. The white race, in its different branches, has from the beginning of time had institutions, political and religious, essentially different from, exactly opposite, and irreconcilably hostile to those of the colored races; and it developed in one branch, at a very early day, in Europe, democracy; and in another branch, in Asia, the spiritual religion of the Bible—as its peculiar political and religious institutions.

9. In the white race its peculiar political and religious institutions, democracy and the spiritual religion of the Bible, both while separately held by different branches of that race, and when happily united, first in Europe, and afterwards, under more favorable circumstances, in America, have been in perpetual conflict with the institutions of the colored races; until at this day, in Europe, of the political institutions of the colored races, monarchy and aristocracy alone, and these, in a shattered condition, remain. And in the United States of America all the political institutions of the colored races, centralized political power or despotism, or monarchy, caste, slavery and polygamy, have been legally abolished; and the peculiar political institution of the white race, democracy, according to the constitution and the law, and with irresistable power, though now eclipsed for a moment by a dark but passing cloud, rules supreme.

10. That modern civilization, found only in the white race, is due to the union of democracy with the spiritual religion of the Bible, may be inferred from its gradual growth, proportioned to the development of these institutions, and to the removal and weakening of the conflicting opposite institutions peculiar to the colored races.

11. The uniformity with which the colored races oppose with all their political power, both direct and indirect, the fundamental institutions of the white race, which constitutes modern civilization, has been raised to the certainty of a natural law by the verification of it furnished by the Congress of the United States in its experiment of violating it, by the passage of the so-called reconstruction acts, which, for a temporary purpose, give suffrage indiscriminately to negroes, debased by recent slavery, and take it away from large classes of intelligent and honorable white men. For this action of

the Congress of the United States is the first instance in history of the deliberate exercise of unconstitutional, centralized, political power and rank despotism, by an American Congress; and must be referred for its cause to the indirect political power or influence of the colored race, as that influence is the only new political agency in the case. And the exercise of direct political power by the colored rac, in pursuance of this action of Congress, has already, in the case of the Alabama mixed convention of blacks and whites, resulted, by the black vote, in acts cruel, vindictive, and blindly and intolerably hostile to the whites, and eminently unchristian.

12. It is a high crime against modern civilization for any people of the white race to give political power in its own country to any colored race, in face of the observed uniformity amounting to a natural law; according to which all the colored races, at all times and in all places, have, so far as their power and influence extended, established and upheld political and religious institutions hostile to those on which modern civilization reposes.

13. By virtue of the constitution of the United States, as soon as the late war came to an end, by the surrender in good faith of the defeated party, every state composing the Union was entitled to immediate, unconditional, and equal representation in the Senate of the United States, and to representation in the House of Representatives, according to the ratio of its white population,—slavery the reason which allowed three-fifths of the colored race to be represented, having ceased to exist.

14. All officers, military and civil, who have participated in the enactment or execution of the unconstitutional so-called reconstruction acts of the Congress of the United States, have incurred, a grave responsibility to the whole people of the United States.

15. The whole executive power of the general government is vested, by the constitution, in the President of the United States, the concurrence of the Senate with the President required for the appointment of executive, as well as judicial officers of the government, being a salutary relief of the President's responsibility, and at most a check, but not an abridgement, of the President's executive power. The President of the United States, therefore, cannot constitutionally be directly or indirectly compelled by the co-ordi-

nate judicial and legislative departments, which have no participation in the executive power, to execute any legislative act, however passed, which he deems unconstitutional; nor can he voluntarily execute such an act, he being restrained by his official oath to preserve, protect and defend the Constitution of the United States, to the best of his ability.

16. The legitimate result of the late war was to put down the disorganizing doctrine of State Sovereignty, by deciding that one State, or a few, should not settle political questions which affect the whole Union, and to strengthen the foundations of the democratic principle of equal State Rights.

17. The action of the Congress of the United States in passing the so-called reconstruction acts, and thereby introducing direct negro suffrage in a portion of the states, by military, unconstitutional, despotic power, against their will, and its influence upon all of them, is an unexpected application of the doctrine of State sovereignty by those who had just made war upon it, and a new verification, as forcible as the rebellion, to prove its disorganizing tendency. For by these acts a number of States, less than the whole, attempt, by illegally assumed sovereign rights of despotic lordship, to settle political questions deeply and vitally affecting all the states.

18. The democratic principle of State Rights, or of localized political power, accords to the people inhabiting, as their own, any locality, the exclusive power of determining all political questions by which it is exclusively affected,—whether that locality be a town, a county, a city, a State, or a whole union of States; and this principle, by investing the general government exclusively with the political power necessary to promote the general welfare, and by giving to the subordinate State, city, county, and town governments the powers which are necessary to regulate the exclusive interests of each, secures to every individual of the people the highest national, as well as the near and dear State, city, county, and town, home rights.

19. It behooves the Legislatures of all the States gravely to consider whether they ought not, by appropriate resolutions and instructions, to urge upon the representatives of their respective States in Congress immediately to expunge, as dangerous precedents, the so-called Reconstruction acts of Congress, which grossly

violate the essential democratic principle of State Rights, and which, in the rotation of political parties, can be hereafter used as arguments for arbitrarily taking away, for mere partisan purposes, the most cherished rights of those States, which by their silence, if not by more significant signs, have unadvisedly given countenance to the outrages which these acts inflict upon their sister States of the now afflicted South.

ART. V.—LAST DAYS OF THE CONFEDERACY.

BY HON. W. S. OLDHAM.

CHAPTER III.

After having remained eight or ten days in Newman, we learned that all the raiding parties, that had taken different routes in Alabama, had now concentrated with the main body under General Wilson, and gone in the direction of Macon, Georgia. Whether they had left garrisons at Montgomery and Selma, or had destroyed the railroads we could not ascertain. General Clarke and I therefore determined to take the train, "feel our way" and go as far as we prudently could, and then obtain transportation across the country through Alabama. We accordingly bid adieu to our kind friends at Newman, and proceeded on our journey. Upon arriving at La Grange, we ascertained that we could not proceed with safety to Montgomery and Selma, but would have to take a different route. Learning that a quarter-master's train would leave La Grange in a day or two for Oxford, Alabama, on the Blue Mountain railroad we determined to avail ourselves of that occasion, and remain in La Grange until its departure. At the depot we met the Hon. B. H. Hill and his lady, by whom we were pressingly invited to become their guests during our stay, which we did.

After the surrender of the army of Virginia, under General Lee, it was hoped that the large number of men who had escaped, would make their way to, and join the army under General Johnston, then in North Carolina, and that he would be able to extricate himself from the dangerous position in which he was placed, and con-

tinue the struggle for Confederate independence. But the end was fast approaching, and this hope, like every other of a similar character, was soon to be dispelled. The news arrived at La Grange while we were there, that the army under General Johnston had capitulated.

After the surrender of the army of Virginia, General Johnston was surrounded on all sides by the enemy, whose forces were nearly ten times as numerous as his own—he was without supplies, and in a country completely exhausted in all directions. It was impossible for him to extricate his army, and he was forced to capitulate. He therefore entered into terms with General Sherman, by which it was agreed that he should surrender the forces, and military department under his command, together with all arms, stores and public property, and the latter guaranteed security to both soldiers and citizens engaged in the service of the Confederate States during the war. But as General Sherman did not have the authority to make the guaranty, the surrender was made prospective, until the Government at Washington could be heard from upon the subject, and he pledged himself to use his influence with the Government to secure the ratification of the guaranty. An armistice was agreed upon until the Government should be heard from. It subsequently transpired, that President Johnson repudiated the guaranty, and ordered General Sherman to demand the unconditional surrender of the Confederate army. To this demand General Johnston was compelled to yield, and the war was ended.

The evacuation of Richmond and the subsequent capitulation of the army of Virginia startled the people of the South with astonishment and terror.

Those events appeared to have stupefied the public mind, and prepared the people to receive the news without surprise of the rapidly following events of the bloody and disastrous drama, and to submit to the fate which the will of the conquerer might vouchsafe to grant them. There was such unbounded confidence in that army, inspired by the bravery of its soldiers on so many bloody fields, by the many glorious victories they had achieved, by the fortitude and endurance they had displayed under all the hardships and privations to which they had been subjected, there was such faith in the genius, skill and prowess of its great commander, that the army was regarded as invincible and Richmond impregnable.

It was, therefore, difficult for one not acquainted with the true condition of things to realize the startling facts that General Lee's lines had been broken, Richmond and Petersburg had been evacuated, and, finally, that the army of Virginia had capitulated.

Thus, after four years of herculean efforts, and numberless disastrous defeats, Yankee obstinacy, perseverance and fortitude finally triumphed in the capture of Richmond. The first military movement which was made by the enemy after the fall of Sumter was against Richmond. The failure of one expedition was followed by another campaign, upon a larger and greater scale. Army after army was raised, organized, disciplined and sent against it, each in its turn to be defeated and dashed to pieces. The army under General McDowell was disastrously routed at Manassas, in 1861.

The grand army, under General McClellan, was almost annihilated in the seven days' battle around Richmond, in 1862. The remnants of the same army, reorganized and reinforced, under command of General Pope, was in a short time after defeated in the succeeding battles, and finally driven to the fortificatons of Washington City. In December of the same year the army under General Burnside was crushed at Fredericksburg. In May, 1863, the defeat of Hooker, at Chancellorsville, was terrific.

The army of 1864 was upon a grander scale than any of its predecessors, and General Grant was placed in command of it. The campaign opened with the battle of the Wilderness, followed by that of Spottsylvania Court House. The destruction of the enemy was terrific, sufficient to have deterred any other commander with less obstinacy than General Grant possessed. Being unable to break General Lee's lines, Grant attempted to turn his right flank and march on to Richmond, but General Lee was always able to keep in his front and thwart his plans. Those constant flank movements by the one and counter movements by the other, after several weeks of maneuvering, brought the two armies within the neighborhood of the city, when General Lee retired behind his entrenchments. Grant attempted to force his lines at Cold Harbor, but was easily repulsed, with great slaughter. He thenceforth ceased hurling his immense columns against our lines, where certain and terrible destruction awaited them, set himself down before our fortifications, and resorted to the slow but more certain

means of success; those of mining, flanking and starvation. There he remained from June until the following April without gaining any apparent advantage. To the casual observer, and to the people generally, on the last day of March, 1865, the capture of Richmond was as remote as it was on the day of the battle of the Wilderness, nearly twelve months before. The results of the past four years inspired the country with unyielding confidence in the ability of General Lee and his army to hold the place, but Richmond was doomed to afford another example in verification of the military assertion that any place may be captured by siege.

No other city in the world ever had such a power brought against it. There is no mode of estimating the loss of the enemy in men and munitions of war in effecting its capture. I do not think that I err in stating that they lost over five hundred thousand men by death from sickness and in battle, from the beginning of the first campaign, in 1861, until the capture of the city, in 1865—that they lost artillery and small arms enough, had they been collected, to have supplied every army with the first, and armed every soldier in the Confederate army with the second. They lost ammunition enough to have supplied the Confederacy for a campaign. They lost commissary, quartermaster and medical stores upon a similar scale. And finally, in their efforts to capture the city, they expended enough money to build, adorn and beautify ten such cities.

Although the enemy made such a tremendous sacrifice of men and money in order to capture Richmond, there were several occasions upon which they could have taken it almost without the loss of a man.

1. After the battle of Gaines' Mills, on the 27th June, 1862, McClellan's army crossed at night to the west side of the Chickahominy. It was then between the main body of General Lee's army and Richmond, and was within a few miles of the city, without any adequate force to oppose his entrance into it, when it was as easy for him to have changed his base there as to Harrison's Landing. I was not in Richmond at the time, but I have often heard the fact stated, and have no doubt of its truth.

2. Before making his attack at Chancellorsville, General Hooker sent General Stoneman with a large cavalry force to the rear of General Lee, in order to break up the railroad, and, perhaps, to assail Richmond. He arrived in the neighborhood of the city on Sunday evening, 3d of May, 1863. Had he dashed into town that night, or next day, he would have met with no opposition. The place was defended by two or three companies, composed of members of Congress and department clerks.

3. When Kilpatrick and Dahlgren made their raid, in the winter of 1863–4, there were no troops in the place except what was known as the City Battalion, composed of citizens and clerks in the department. They were not sufficiently strong to have checked for a moment a dashing cavalry charge of the enemy. But he attempted to feel his way just at dark, was met by a spirited fire, and, not knowing what was before him, retired. He happened to approach the identical spot where the few men guarding the city had been posted. A mile to the right or left would have given him an unobstructed passage.

4. Before making his attack at the Wilderness, General Grant sent General Sheridan with a heavy cavalry force against Richmond. General Lee dispatched General J. E. B. Stewart with the Confederate cavalry in pursuit of Sheridan. The latter, in advance, arrived at the Yellow Tavern, eight miles north of Richmond, when the sun was two or three hours high. Had he pushed on he would not have found a soldier to have opposed his entrance into the city. That night Stewart got between him and Richmond, and two brigades of infantry arrived from the south side of the James, about midnight. The next day a battle was fought near the city, and Sheridan was defeated and driven back. It was in that battle that General Stewart was killed.

5. When Butler landed from his transports at Bermuda Hundreds, he could have marched unresisted directly into Richmond. There was not a soldier on the south side of the James, except the garrison at Drewry's Bluff, guarding the river.

It was not the fate of Richmond to be taken by surprise, or by a small raiding party, but it was staked upon the issue of battle between mighty armies. It was to fall, and in its fall it was to crush

the army defending it, the political existence of thirteen sovereign States, and the liberties of eight millions of people.

On Tuesday morning, the 25th of April, our wagon train was ready to take the road. My companion, General Clarke, and I bid adieu to our friends, Mr. Hill and his amiable lady, and took our places in one of the wagons. My parting with Mr. Hill was well calculated to call to memory many reminiscences of the past, both pleasant and painful, and to inspire gloomy forebodings for the future of our country. I first met him in the Provisional Congress at Montgomery, when I took my seat as a member of that body, on the 2d day of March, 1861. We had served together as members of that body while it existed, and then as members of the Confederate Senate until the close of its last and final session. For four years we had devoted together all our time, energies and talents to the service of our country in her great and vital struggle. We had exulted at her victories and mourned over her defeats. The country we had served was crushed; her cause was lost; no more battles were to be fought, and victories won by her sons, and no more were her statesmen to meet in council.

"Othello's occupation" was indeed "gone." Although he was opposed to the act of secession by his State at the time, as a "loyal citizen" he readily yielded obedience to her mandate, and rendered fealty to her as his rightful and legitimate sovereign. Had every man in the Confederacy as faithfully performed the duties of his station as did Mr. Hill, our unhappy country would not have been reduced to its present deplorable condition. He is yet but a young man. May he still live to render essential service to his country in the restoration of constitutional government and civil liberty, which must alone be the work of the political philosopher and statesman, but which can never be done by the warrior and revolutionary battles. We parted. He remained at home, quietly to await the fate that might befall him, and I to seek an asylum in another land.

I will here remark, by the way, to the credit of our enemies, that the raiding party which visited Lagrange but a few days before had acted much more like civilized men than Yankee soldiers had been in the habit of doing. It is true that they took mules, horses,

some other property and a few negroes, burned the depot and public stores, and destroyed the switches upon the railroad, but they burned no private dwellings, and committed no outrages upon individuals. After the main body left the town several robberies were committed by two or three straggling parties of soldiers in the country. But, to the disgrace of the people, no resistance was offered to such outrages, whether committed by one or more. It was a truth that the spirit of the people of Georgia was broken, and she was fully subjugated.

The condition in which I was now placed was anything but flattering or agreeable. Our great armies had capitulated, and the war had evidently closed. The whole country was filled with the cavalry of the enemy, who could, even in very small numbers, go wherever they pleased without the least fear of resistance; the railroads were all destroyed; I was fifteen hundred miles from home, with no mode of travel, but with a quartermaster's train, which offered a tempting prize to the "jayhawkers," with which the country through which we had to pass was filled. There was nothing in "the situation" to inspire unbounded confidence.

At Lagrange we were joined by Brigadier General Ector, of Texas, his wife, son and Adjutant General. They, too, were forced to take the wagon train, and became companions of our voyage. Ten or twelve miles from Lagrange we crossed the Chatahooche river, not far from the line, Randolph county, in the State of Alabama—"the State of Randolph," as it was called. This county and Carroll county, Georgia, adjoining it, had become notorious for the toryism of their people and as asylums for deserters from the army, as the homes of "jayhawkers" and robbers, and for the lawlessness of their people. Those two counties were quite populous, and at the beginning of the war sent a large number of volunteers to the Confederate army. Within the last year or two numbers of those soldiers had deserted and come home, and had fraternized with the Union men. They had organized themselves into bands, and chosen their leaders, and laid in the woods or roamed through the country, perpetrating robberies upon citizens of Southern sentiments, upon Confederate officers and soldiers and other travelers. They at length became strong enough to scorn concealment.

I was told that they numbered at least five hundred in Randolph, and eight hundred or a thousand in Carroll, and had established a regular line of couriers to the Yankee posts in North Alabama and Tennessee, for the purpose of conveying and receiving information. They were, in fact, "masters of the situation."

Like all robbers and bands of lawless men, they had shown no disposition to attack armed bodies of men, although of inferior numbers, but woe to the citizen or Confederate officer or soldier, riding a good horse or with money in his pocket, who chanced to fall into their hands. If he escaped with life he was fortunate and did well; his horse and money became spoils and trophies in the hands of the marauders. Several robberies had recently been committed by them. The prospect looked indeed quite favorable for our train to be picked up as a prize of war, and for us to be handed over to the Yankees as prisoners. We were, however, fortunate enough to escape, which I attributed mainly to the fact that we had along with us, as a guard, some "fifteen men with guns," whom I soon discovered had no appetite for a fight, and did not intend to engage in one if the opportunity should offer. The imposing display of soldiers and muskets, I am however satisfied, saved us.

One might conclude from the appearance and character of the country that it was made for just such a people as those by whom it is inhabited. It is hilly, and sometimes mountainous, and wild in the highest degree—with a soil of the very poorest and most unproductive quality. The population corresponds with the aspect of the country and the quality of its soil, being extremely poor, ignorant, rude and wild. Their habitations are small, uncomfortable log cabins, usually surrounded by a little patch of cleared land, from one-fourth to four or five acres, upon which they raise a few vegetables and a little corn. It looks almost impossible for men with families to derive from such a quantity of land and from such a soil a sufficiency even to support life. I was told, however, that on all the streams there are valleys of very rich land, which are owned and occupied by men of wealth and intelligence.

Early on the morning of the second day after leaving La Grange, we crossed the line between Georgia and Alabama and entered this delectable district. Our attention was attracted to a fact, which at first we could not account for. At almost every cabin we passed we saw from two to a half dozen women, but rarely saw a man. At first we supposed the women were the wives of soldiers in the

Confederate army, and were living together for mutual protection; and then that perhaps they were the wives of deserters who were concealed in the woods and mountains. The problem was subsequently solved.

During the day, as some of our company were approaching a house, several women came out and began waving handkerchiefs to them, but upon the arrival of the men at the house, the women showed signs of alarm and fright. Upon being asked why they had wayed their handkerchiefs, one of them answered that she would tell, provided the men would not become angry and harm them. Upon being assured that she had nothing to fear, she stated that they had mistaken the men for Federals and had saluted them as friends, but had become frightened upon discovering their error.

During the day we were informed that there was, some few miles in advance of us in the neighborhood of Wedowah, the county seat of Randolph county, a body of armed men, numbering over one hundred, but who they were, whether Federals or "jayhawkers," we could not learn. Major Martin, who had charge of the train, sent forward two of his soldiers to reconnoitre and report. Towards evening, we met several suspicious looking men, with rifles and shot guns. They appeared rather sulky. We met two or three persons who concurred in their statements, and were informed by them, that a raiding party of several hundred Yankee cavalry had come from Selma to Oxford, and had destroyed the Blue Mountain railroad up to the latter place. That they had then turned east, and taken the road upon which we were traveling. That two days before, they had burned a cotton factory on the Talapoosa river, and were now on our road, between us and Oxford, from which we were distant about forty miles.

Things seemed to be culminating, coming to a crisis. Our prospects of running without notice, into a nest of "jayhawkers" or Federal cavalry, was quite reasonable, but not very cheering. We were not strong enough to fight a large force, having but fourteen muskets, and about thirty men, consisting of soldiers, teamsters and passengers. Our chances of escape by running were not promising. Our teams were slow, and the wagons were heavily loaded, and if we left them and took to the brush and the hills, our chances of starvation or being picked up, were almost certain. We could not turn aside or go back; forward, was our only course, and we traveled on.

That night we stopped about six miles east of Wedowah, at the house of an old man by the name of Doctor Robinson. He was said to be a man of some intelligence. He informed us candidly that he was, and had at all times been a strong Union man, but hoped that he was a true friend to his country; that he differed from us only in the mode of proving his friendship. He informed us that we were in danger from the lawless bands of "jayhawkers," with which the country was filled. That two or three hundred of them were then near Wedowah, and intended to destroy the town that night. We could now comprehend the reason why we had seen no men during the day, and why the women had congregated together at the houses on the road. Our host appeared to be a clever man, barring his Union sentiments. He treated us with generous and cheerful hospitality. Major Martin stationed guards around his train. Several times during the night men were seen cautiously approaching, who, upon being challenged by the guard, fled precipitately.

Fortunately, our road in the morning was to the right, by which we passed Wedowah four or five miles on our left, and thereby avoided the "jayhawkers" assembled in that vicinity. After starting, we were informed that, during the night before, the court house, jail, and several private residences in the town had been burned. The reasons assigned for their destruction were, that the court house had been used for offices by the Confederate officers, who had been stationed there on duty. That deserters had been confined in the jail, and that the owners of the residences destroyed were obnoxious, on account of their Southern sentiments, and the activity and zeal with which they had supported them.

After traveling about seven miles, we came to the east fork of the Talapoosa river. The bridge across the stream had been partially destroyed, which made it necessary for us to turn through a farm to a ford. When we had arrived at the ford, upon looking back upon the hill, we discovered eight or ten men who appeared to be watching us. They, however, approached no nearer. We could not tell whether those we saw constituted the surprise force, or composed the advance of a larger body, who were deterred by our apparent force.

At the river, the two men whom Major Martin had sent forward the evening before came up. They reported that after they left us, and proceeded about two miles, they came suddenly upon a

party of twenty or thirty armed men, and were made prisoners. The thieves proposed to take their arms and horses, but the men told them that they were deserters from the Confederate army, and needed them. That appeal prevailed. The men were detained as prisoners during the night and discharged in the morning, when they hurried on after and overtook us.

After crossing the river, we met a man, who gave us the same information that we received the day before—that on Tuesday a party of raiding cavalry had burned a cotton factory on the Talapoosa, but that he did not know what road they had then taken. The factory was about twenty miles before us, and this day was Friday. We were satisfied that they had taken a different road from the one which we were traveling. Towards evening we arrived at the east branch of the Talapoosa, and found the heavy timbers of the factory burning. Upon leaving Oxford, the Yankee cavalry took the road to Newman, Ga., but sent a company upon our road to burn the cotton factory, who, after they had performed that work, turned back and rejoined the main body, thus leaving our road clear.

The bridge across the river had been partially destroyed by the Yankee cavalry, but was soon repaired by our company, upon which we passed over and traveled several miles beyond, to a little village called Tulipina. We staid all night with a man by the name of Crawford, who claimed to be a cousin of John C. Calhoun. Whether it was so or not, it is certain that had Mr. Calhoun been living, he could not have been a stronger Southern man than Mr. Crawford. His wife was as strong a Confederate as her husband. They had lost two sons and a son-in-law in the war, and their widowed daughter, with her orphan children, was living with them. He informed us that in consequence of his strong Southern sentiments he had become quite obnoxious to his Union neighbors, who had frequently threatened to kill him. He was a man of but ordinary intelligence, and, from appearances, in possession of no very large amount of property.

The next day we reached Oxford, seventy-eight miles from Lagrange, having safely flanked all hostile parties of both jayhawkers and Yankees.

Upon our arrival at Oxford we learned the amount of force of the Federal raiders, and the extent of damage committed by them on the line of the Blue Mountain railroad, about which we had been

constantly hearing since we crossed the Chatahoochee river. The force consisted of about eight hundred Yankee cavalry. They had marched from Selma to Oxford, along the line of the railroad, through the heart of the State of Alabama. They had torn up the railroad at various points, and had destroyed all its depots and storehouses, and every locomotive and car upon the road except one locomotive and two or three platform cars. They had also completely destroyed a number of iron foundries located upon the line of the road. They were allowed to commit all this damage without meeting with one particle of resistance, except that offered by General Davidson at the head of a few conscripts and deserters, whom he had in camp at Blue Mountain. Placing himself at their head, he met the enemy and fought them for two or three days, and succeeded in killing or capturing between fifty and one hundred of them. This took place in the great State of Alabama, which contained thousands of able-bodied men then not in the field, and in the department commanded by Lieutenant General Taylor, whose rolls numbered over sixty thousand men. The fault was not General Taylor's. His army was reduced by desertion to a mere skeleton. Both soldiers and citizens of that department—like those in the department commanded by General Johnston—seemed to have lost all hope, all heart and spirit, and sunk down into a kind of stupified despair. The gallant energy and dash, which were so often and so brilliantly exhibited by so many of both officers and soldiers during the war, were gone. Even Forrest, with all his bravery, energy and capacity to make even cowards fight, had to submit to the mortification of seeing Selma taken by the Yankees, opposed by a single brigade (Frank Armstrong's), in consequence of his inability to get his subordinates to bring their forces up in time. I heard it said as I passed through Alabama and Mississippi that at the time of the race between Forrest and the Yankees, as to which should first get to Selma, one of his brigadiers accepted an invitation to a ball, and halted his command for twenty-four hours to enable him to attend it. The defiant confidence that lighted up every face at the beginning of the war was gone. The cheering shout of the soldier, as he was whirled along by the speed of the locomotive to the army "to the front," was no longer heard. The country was subjugated and prepared for submission upon any terms or conditions the enemy might

see proper to impose. What caused all this and produced such an extraordinary state of things presents an interesting but a painful subject of inquiry, to which I shall hereafter address myself.

At Oxford we were informed that the only locomotive and cars left upon the road were running up to Taladega. This, however, proved to be untrue. Through the influence of Major Martin, the officer to whom he had delivered his train sent us down to Taladega in a wagon, the day after our arrival at Oxford.

About three miles distant from Taladega we met Hon. J. L. M. Curry, a former member of the Confederate and also of the U. S. Congress, and his brother, on the road. He invited Gen. Clarke and myself to stay with him until we could find some conveyance from Taladega to the station to which the train ran; that he lived at the house in view, just ahead of us. Up to this time we had been under the impression that a train was running irregularly from the Cababa river to Taladega. We accepted the invitation and remained with him until the Tuesday morning following. The train ran us higher up the country than Childress station, twenty-five miles below; it therefore became necessary for us to look about for another wagon to carry us to that point. The quartermaster at Taladega intended to start a train of wagons down to that station on Tuesday morning, and we patiently waited for its departure. Our traveling companions, Gen. Ector and family, became the guests of a friend, living between Mr. Curry's residence and the town. We sent into town and made arrangements with the quartermaster to transport us to Childress station.

Tuesday morning came, when Mr. Curry sent us and our baggage to Taladega in a wagon. We called for Gen. Ector and family at Judge Heflin's, where they were staying. Upon our arrival in town, we found the quartermaster's wagons waiting for us. We took our seats and were soon upon the road again. There were several other passengers; amongst them were a Louisiana major, his wife and two sisters. He had belonged to the army of Virginia, and they had gone to that State in order to be near him during the war. Upon their arrival at Atlanta, on their way home, the major purchased two mules and a light wagon. The team proved unable even to haul all their baggage, so the ladies were compelled to leave everything, except what they absolutely needed, on the road. As the load then was as much as the mules could draw, the ladies were obliged to walk from Atlanta to Taladega, about one hundred

miles. They joked and laughed about their difficulties with much good humor. They were quite intelligent and interesting. On the next morning we arrived at the station, but no train was there, and no person could tell us when it would come. We had to make a virtue of necessity, and wait for it. The next evening it came; two platform cars and a very weak locomotive, as it proved itself to be. It had come up for bridge timbers, with which the bridge across the Cababa river was to be replaced.

ART. VI.—SEWERAGE AS A SANITARY MEASURE FOR THE CITY OF NEW ORLEANS.

Economy in the Budget of expenses of the City and of that of Proprietors, and incidentally in the interest of Agriculture in the State and elsewhere.

BY T. C. DALAVIGNE, ESQ.

We Americans flatter ourselves with being a progressive people, and are very apt to boast of any good thing we may do. And yet, in some things, upon a little investigation, it may be found that we are far behind the Old World in many proper, useful and advantageous things. In this particular matter of sewerage it should not be strange that our transatlantic neighbors should be far ahead of us, because in their old towns and cities they have had more time and leisure to see to those things than we, in our towns and cities, which are born but of yesterday, and yet growing with wholesome rapidity. We have had the advantage of having models to copy from, and the chances of avoiding their faults and availing ourselves of their improvements, neither of which we have done. We have intelligence and knowledge enough to enable us to order ourselves properly, it may be, and this may flatter our vanity, but a little wisdom should induce us to lay aside a little of this vanity, and adopt from our neighbors some of the plans and processes which experience has shown to be good and wholesome. On this subject we copy the following extract from the *Southern Cultivator* of November, of an address by Professor T. W. Johnson:

THE EARTH CLOSET.

"There are two grave questions which enforce attention from every dweller in the city, and should not be neglected by those who have the country for their home. These questions relate to the disposition of the liquid and solid waste of the human body. One of them is, how shall the waste be effectually prevented from being an annoyance and source of disease? and the other, how shall it be made a means of fertility to the soil, and thus an item of national wealth?

"Nothing is better established than the connection between human excrement and certain fearful epidemics.

"It is on all hands admitted that the cholera is most frequently and certainly transmitted to healthy persons by the intestinal evacuations of those who have been sick with the disease. Typhoid fever, a form of disease very prevalent among us, is often traceable with scarcely less certainty, to privy vaults, cesspools, and sewers. It is stated that Prince Albert, of England, probably contracted the disease that was fatal to him from the foul air that found its way into his study out of a forgotten sewer, through a crack in the wall.

"Most often it is our drinking water that brings into us the contamination. In multitudes of cases the well is but a few yards or feet from a cesspool, that receives the kitchen slops on one hand and a privy vault on the other. The writer knows a well which furnished good water about five years after it was excavated, in what was, until then, a vacant lot; but after this interval, became unpleasant to the taste, its flavor plainly suggesting the nature of its impurities.

"In his researches of the cholera in Bavaria, in 1854, Pettenkofer traced its spread, in several cases, in the most indubitable manner, to the use of water which had been in contact with the fœcas of cholera patients.

"The safest mode of escaping the evils in question, hitherto adopted in closely built towns, consists in removing all human excreta to a distance, by subterranean sewerage.

"The waste involved in the 'civilized' way of treating the materials under notice is immense. Every harvest brings from the

country to the city, from the West to the East, a vast bulk of beef, corn and hay, whose use to the city people does not, for the most part, consist in any permanent giving of the elements, but which, after having weighed the wheel of life through half a turn, and dropped off as waste, admits of conversion into food again, if but carried back to the fields. The gardeners and farmers in our immediate vicinity are obliged to disburse heavy sums each year for the phosphates and nitrogen which their crops demand, and which their land cannot adequately supply. The guanos and fish manures, which are brought from a distance or manufactured at heavy cost for their use, are not in reality paid for by them, but by those who purchase their produce in the city markets. The animal who stands at the head of creation requires the richest food, and yields to the food producer the richest return. It requires but little art to convert his excrement into manure, and the conversion may be made extremely profitable.

"The means of satisfying, at once, all demands of sanitary science, and of agriculture is, however, fortunately everywhere at hand, and of extreme simplicity and cheapness in its application. Dry and fine earth is the material.

"This property of earth is no new discovery. Its use was prescribed to the Israelites (Deuteronomy, xxiii, 12 and 13), and is turned to good account by the instincts of our domestic carnivora. The Rev. Henry Moule, an English clergyman, was the first to elaborate, by a careful study of the subject, a plan for the systematic employment of earth for this purpose.

"The arrangements required to constitute an earth-closet are not necessarily complex or expensive. It is only needful that a space be had below the privy seat, the bottom of which should be of flagging or cement, and a little above the ground level, or at least protected from the wet of rain and of the ground. The space should communicate with a shed at the rear of the privy, to hold one side a load or two of dry fine earth (not sand) or sifted coal ashes, and leave an equal room unoccupied on the other. For hospital or sick-room use, either a simple commode or pail, with a hod of earth to apply, or the self-acting commodes of Mr. Moule may be used.

"Very important it is that hotels, schools, and, we may add, colleges, should be provided with this labor and health-saving arrangement.

"In large schools it is sufficient to put the application of earth in charge of an attendant. In hotels the self-acting apparatus is better.

"The fertilizing value of the properly managed composit should be abundant remuneration to parties supplying earth, especially as its carriage is not attended with the slightest odor, and requires not the cover of darkness to mitigate its terrors, while its use is less disagreeable than that of Peruvian guano, and not worse than the employment of any old composit.

"Reader, lose no time in providing yourself, and inciting your neighbor, to provide some form of earth-closet in lieu of the vault, which has hitherto sufficed. Health and economy both demand it! City authorities would do well to enact that all privies within a hundred feet of dwellings, or of wells in use, should be converted into earth-closets, and to provide for their systematic and thorough inspection."—Prof. S. W. JOHNSON, in exchange.

ART. VII.—COMMERCIAL FERTILIZERS.

[Translated from Payen-Chimie, Industrielle, p. 95.]

BONE BLACK, WITH ANIMAL REMAINS—GUANO.

Among the facts which have contributed to the solution of the great question of public interest, we should cite the first application made in agriculture of a fertilizer, offering every condition of utility; the presence of an antisceptic agent (powdered coal), and of an highly nitrogenized organic matter (coagulated blood), besides the phosphate of lime and other salts useful in vegetable nutrition.

During the first years of the application in refineries of fine bone black and bullock's blood, for the discoloration and clarification of syrups, the residus, being a mixture of bone black and blood, accumulated in the refineries, was thrown away as refuse. In 1822, at a meeting where I had adverted to a successful application made

by myself, trials were made of these residues as fertilizers. The happy results obtained soon enabled the refiners to sell to advantage these refuse products, the price of which now exceeds the original cost of the bone black. So that the refuse of clarifications sells higher than the original fabrication for the express purposes of discoloration.

The bone black residue of clarifications, used principally in the western departments of the Loire, and transported to Nantes from the French towns where there are refineries, but also from England, Hamburg, Amsterdam, Russia, &c., and also in France as fertilizers in the west of France, exceeds annually twelve million kilogrammes (27,000,000 pounds.)

Phosphates used on soils already containing them are without effect; new bone black is efficacious only in so much that it contains still azotized substances after calcination. These results have led to the appreciation of the value of blood as chief ingredient in the remarkable effect produced in residues of coal from the refineries.*

In comparing the effect obtained from bone black, containing 15 or 20 per cent of blood and an equivalent quantity of blood alone, it has been ascertained that the bone black produced four times the effect of the blood which it contains. This apparent anomaly is explained by the coal having the faculty to retard putrefaction, and of absorbing the gases escaping from it. The blood being mixed with coal decomposed more slowly, allowing time to plants to absorb and assimilate the products of fermentation, whilst, if used alone, would decompose rapidly and evaporate into the atmosphere.

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*In England numerous experiments made by Messrs. Harmam, Thackeray, Spooner, Lawes, &c., have demonstrated that the phosphate of lime, without animal matter, produces little effect as a fertilizer, whilst the bones containing animal substances, and pulverized, have a powerful effect. The way of preparing them is as follows; 200 pounds of bone, pulverized or crushed between cylinders, soaked with five gallons of water for 24 hours; then 75 pounds concentrated sulphuric acid is added, in which condition they are left during four or five days. They may then be further dissolved in water, and used with a watering pot to water plants; or, by adding 100 pounds of bone black, they may be reduced to powder. These quantities are sufficient for one acre. Remarkable products have been obtained with this fertilizer, especially for rutabaga.

BONE BLACK WITH ANIMAL SUBSTANCES.

When the useful effects of the bone black from the refineries became well established by practice and use, the demand for it became so great that the source of supply was insufficient, and intelligent manufacturers went to work to produce something analogous.

It was necessary to produce a porus, powdered coal, acting as a disinfectant, and to mix it with animal substances in the same proportion as contained in the refuse from the refineries. This disinfecting substance is obtained by baking vegetable mold containing sufficient organic substances to make it of a brown color when pulverized. Otherwise it would be possible to add to it some carbonaceous substance of a low price, such as coal or wood tar.

The earth thus used should be argilaceous, and contain some carbonate of lime. Pure clay might be used, and would be very absorbing, provided it be not heated to a higher degree than required for the carbonisation of organic substances (260°), because by a higher degree of heat it is contracted and its porosity diminished. Light sandy soils are not absorbent enough for the purpose.

This carbonized earth, by reason of its antisceptic and absorbent virtues, is successfully employed in the manufacture of fertilizers called *noirs animalisis*, coal with animal substances, made with night soil. The disinfection produced by the earth will be the more complete by the addition of a small quantity of some metalic salt, such as sulphate of iron or chloride of manganise. These salts transform the volatile products into inodorous compounds by means of a double decomposition—the carbonate and sulphydrate of ammonia are changed into metalic sulphates and fixed amoniacal salts.*

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*The composition of various chemical operations, such as these containing mixtures of protoxide and lesquioxide of iron and sulphate of copper, have been used successfully in the manufacture of fertilizers. The fœcal matter of several large cities are thus utilised with the use of disinfectants, by giving them the form of *noirs animalisis*, animalized coal. These great practical improvements have received premiums from our scientific societies.

The manufacture of these fertilizers is carried on at Marseilles, Lyons, Tours, Bordeaux, Orleans, Poitiers, Nevers, Mort, Nantes, Havre, Rochfort, Besancon, Montauban, Limoges, Metz, Amiens, Troyes, Rouen, Toulouse, and is going to be introduced at Paris

It would certainly be very desirable that the system of disinfecting should be introduced upon farms to convert fœcal matter into a fertilizer convenient and easy to handle. It would be especially desirable for the enormous deposits of this matter at Montfaucon. For the purpose of converting it into *poudrette* it is dried in the open air. The operation is retarded by the rains, and sometimes requires five years. By fermentation and washing, the substance loses four-fifths of its value, and infects the air at great distances. The value is again diminished one-half by the addition of muck to hasten desication.

For ages, fœcel matter has been employed in Flanders as a fertilizer, and sold under the name of *Flemish fertilizer*. It is enclosed in vaulted cisterns, from which the gases are allowed to escape by a small aperture, the atmospheric air being excluded, fermentation is suspended, and, by this means, loss avoided.

This fertilizer is used in the liquid state, and conveyed to the fields in hogsheads, and spread by dripping through a hole upon an inclined plank. Sometimes the plants are watered with it by giving a small quantity to each plant.

The use of these infectious fertilizers is very objectionable, on account of the taste communicated to the vegetables, very sensible in some fallacious plants, and communicating a disagreeable taste to milk when the cows are fed with them.

The droppings of animals restore to the soil the mineral salts, and a great portion of the nitrogenous substances necessary to the nutrition of plants.

The detrilus of animals from the butchers' yards would make a rich fertilizer. Coagulated blood, and cooked and dried flesh, are sent to the colonies to improve the soil for sugar-cane, and it is remarkable that it should be better appreciated there than at home

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The manufacture of these fertilizers is very simple; the privies are emptied by a pump; upon the mass is added 2 per cent of the solution of sulphate of lesquioxide of iron, mixed with sulphate of copper (mother water of copperas); the disinfected matter is extracted in any convenient manner. At the factory works this matter is thrown upon a quantity of prepared earth, and covered with the same, and mixed so as to form a friable mass. It is then spread under sheds, and when dried may be further enriched by another mixture. Mr. Gussnett disinfects and clarifies the liquids in the privies with a mixture of one pint of oil with four pints of a nearly saturated solution of sulphate of zinc, to one hundred pints of liquid.

and that the Peruvian guano should be brought to Paris from a distance still beyond those places. It became known through Humboldt that for ages the guano had been used to fertilize the arid sands of Peru; but it has been imported only since the publication of works on the nutrition of plants (Annalis de Chimio, 1841 and 1842). This fertilizer is now much sought after, and is the product of the droppings of birds, accumulated from time immemorial. (Some geologists suppose it is the remains of animals of a remote age accumulated in estuaries, which are found also in the West India islands, and of which a very remarkable deposit is found at Charleston, South Carolina; also, in New Jersey, and other places in the United States.—*Translator*).

A great number of the residues of substances from manufactures where animal products are used, have been converted into fertilizers. But unfortunately great frauds have been practiced upon the unsuspecting farmers, and thus injured the reputation of these products. We have pointed out the possibility of making a correct analysis, and of graduating prices according to quality.

Farmers now admit that the phosphates and detrilus of animal matter make the best fertilizers. The difference between these and vegetable matter consists in the greater abundance in the first of nitrogenous matter, putrescible and decomposing into gases or soluble matter fit for the nourishment of plants, and can be absorbed by them only in that form, and the necessity of the presence of nitrogenous matter is proved by the analysis of the plants themselves.

We have shown that the sap of young plants, the buds, and the parts where the vital energy is the greatest, contain, in their organization, before the leaves are developed, a great quantity of azotized substances analagous to animal matter; they can hence be sustained by cognate substances in the detrilus of animal substance.

In the composition of fertilizers, azotized organic substances should form an essential ingredient, because they are indispensable to the nutrition of plants, and are generally deficient in soils, and never found in excess. To determine the quality of a fertilizer, it may be compared to another of known value, which is known by the quantity of animal matter it contains.

No doubt if the soil be deficient in inorganic substances, these should be given to it. But these mineral substances can generally be obtained at a low price, such as stimulants, marl, plaster (gypsum), ashes, lime, &c.

No doubt, also, that the detrilus of vegetable matter forming mold and humus may furnish an important portion of the nutrition of plants, by furnishing to them carbonic acid, traces of azotized matter, and especially some mineral salts drawn from the soil by the preceeding crop; but these, with whatever care they may be governed, do not constitute a substance of sufficient value to be classed as a commercial fertilizer. Instead, then, of buying such, the deficiency should be supplied by manures and phosphates, and to fix the commercial value, or ascertain the quantity wanted, the quality must be tested by the amount of azotized substances contained.

As an analytical work on fertilizers, Mr. Baussingault and myself took for unity, the farm yard manure, which yields by analysis four of azotized substances in one thousand parts, and in supposing that the annual manuring was to the extent of twenty thousand pounds per acre, the azotized matter was equal to eighty pounds. The strict measurement of this quantity must not be exlcusive of mineral substances, and especially of phosphates, which may, according to the soil or the crop, materially increase the value of the fertilizer.

MODE OF ANALYZING FERTILIZERS.

On the same subject, we think we cannot do better than to give the translation of a chapter from Payen, one of the veterans of the science of chemistry in France, and embodying the substance of what was new and interesting in its application to agriculture. Aside from the sanitary view, it will be seen that it is practical, from its being employed in many towns of France, to the great general benefit of agriculture, and to the benefit of individuals and companies who have undertaken it, and fabricated commercial manures.

As a sanitary measure, a little observation will show that it is now particularly essential to a city situated on a low, flat soil, such as New Orleans. The water is reached very near the surface of the ground, and in some places but a few inches below the surface. There is probably a little more rainfall here than elsewhere, and very little of it is absorbed by the earth, which is already saturated

with moisture. The cess pools throughout the city are built with loose, porous bricks, and sunk a few feet in the soil. They are slovenly built and kept in a slovenly manner, being emptied generally about once a year, and often less. They are not considered as requiring sewerage until the contents rise to or over the surface of the ground. So that in their immediate neighborhood, at least, and how much further we do not know, the soil is saturated with their contents. When there comes a shower the cess pools are either filled up to the level of the ground, and the water percolates through the ground charged with all sorts of impurities, to flow out into the ditches, or overflows the top of the brick work. The inhabitant of the city, whose olfactory nerves have become blunted by the long habit of inhaling the offensive effluvia rising from these causes, does not perceive that the air is tainted, and it is to him a cause of surprise if his attention is called to it by a new-comer, or whose sense of smelling is in a more normal condition. The odors are particularly sensible to one arriving from the country to the city after a shower of rain. That this state of things is injurious to health there can be no doubt. And it is not in consideration of the inhabitants of the city alone that this matter requires reform, but in the interest of visitors, in the interest of trade and commerce, in the interest of the whole country of which the city is the metropolis. Every inhabitant of the South, and Valley of the Mississippi, has a direct interest in rendering the city healthy and removing every impediment to trade and commerce and free and safe communication. Ditches and canals, draining machines, washings, &c., are but a palliative to the evil; even underground drains would not be a remedy, although it might be better than the present surface drainage, because they would require entrances from every house for garbage to flow into them, and every aperture would be a vent hole through which the foul air of the sewer would escape into the atmosphere. The whole system is vicious.

It is peculiarly within the province of the Board of Health to signalize the matter to the attention of the City Council, and it is the duty of the latter to adopt and enforce the proper measures to remedy the evil effectually, and what those measures should be we will now consider.

A hint may be taken from the extract given above, concerning the *earth closets*.

When the removal or abatement of cess pools is obtained, one-half of the sanitary work will be accomplished.

1. The matter of cess pools should not be allowed to come in contact with the earth to be absorbed by it.

2. Privies should be constructed with water-tight receptacles, to give the facility to remove the entire contents.

3. Deodorizers should be used daily to prevent the rise or production of noxious gases.

To arrive at this it will be necessary for the City Council to enact ordinances as police regulations, requiring a particular construction of privies, and providing for the removal of the contents weekly, or semi-weekly at least, with the use of neutralizers and deodorizers.

The proprietors or tenants are now subject to a heavy and expensive servitude for the *pretended cleaning* of privies once a year or oftener. If the city does all this, and relieves the proprietors or tenants of the heavy servitude which they now have to bear, i would seem fair that they should be made to contribute in the expense of a measure resulting in their relief. Suppose, for instance, that each house should be taxed in proportion to its size, or number of inhabitants, or apportion the assessment of the tax in any other fair way; that this tax should be imposed to a sum about equal to the present expense of cleaning privies during a space of five years; that the amount of this tax be employed in making the necessary changes in the privies, &c:

When this shall have been done, one-half of the work of a company who would undertake the manufacture of fertilizers would be accomplished, and would be a strong inducement for the establishment of such a company. As may be seen by the accompanying extract,* it is no new and untried experiment, but a thing in ac-

*The company now established and operating in the city of New Orleans may become very useful if sufficiently developed. It operates on the public establishments. In order to show some facts in relation to it, we refer to an article in the New Orleans *Bulletin*, under date of 3d of December, where it will be seen that employees of the company were arrested and brought before the recorder, to be prosecuted for violation of a city ordinance, forbidding the removal of night soil, except at certain hours of the night. It was established by undoubted evidence that the soil being removed was completely deodorzed, and, although it was done in the middle of the day, was no violation of the ordinance, the recorder ordering the release of the accused parties.

tual and successful practice in France, and which would supply a great want in the agricultural productions of the country. The source from which guano is now obtained has become totally insufficient to supply the necessities of the country. It cannot be said that one kind of manure or fertilizer can be used in the place of another. The peculiar quality in guano, and which gives to it its chief value, is the ingredient of ammonia, and the only source from which it can be obtained is from animal products. Reports show that about 2,000 tons of fertilizers have been used this year in the State of Georgia alone, and the use of them is rapidly extending in the other Southern States. The amount that will be wanted cannot possibly be supplied from any other source than that above indicated.

It is possible that legislation could be so shaped as to be to the interest of both the sanitary measures for the city of New Orleans, and the benefit of the company, to be protected incidentally.

There are other important consequences of such measures: 1st. The creation of the opportunity of employment to many persons who would otherwise be idle. 2d. The furnishing to the agricultural interests a cheap and excellent fertilizer, obtained in a great city, which offers all the facilities for trade and negotiation. 3d. Giving employment and freight to railroads and boats. 4th. And last, but not least, making the country independent of foreign supply, and spending our money at home.

This system of utilizing the contents of cess pools is more important and profitable than it may appear to persons who have not the data from which to judge of its usefulness, and who do not reflect upon it. Let us take for example a farm in the country where there would be ten persons. The amount of excrementitious matter produced by each, five ounces (Liebig), which, with the urine, would amount to about sixteen ounces, equalling ten pounds per ten persons, or three thousand six hundred and fifty pounds in a year. This would yield of dry residue about five hundred and forty seven pounds, containing the richest elements of a fertilizer, and equal, if not superior, to Guano. At the price of Guano, it would be worth forty-one dollars. The amount is not much, intrinsically, but the use and application of it must be considered, besides, that at the same time complete deodorization has been obtained with the simple use of dry dirt and a few pounds of copperas. We will suppose further

that this is done on a sugar farm, and that the land, without fertilizers, would produce one thousand pounds of sugar. With the proportionate quantity of molasses, this would be worth in the market about $175. The quantity of fertilizer produced would be sufficient to put upon two arpents of land, and would double its product, equal to $350. The labor and expense of producing the fertilizer is so inconsiderable, that it would be hardly appreciable, and so also for the enhanced product. But, making a liberal allowance for both, by deducting fifty dollars, it would still leave a clear gain of three hundred dollars, dropping into a man's purse as if it came from the skies.

We shall in our next communication have something to say on the manure heap, which can be made five times more valuable than it is.

[From the Atlantic Monthly.]

ART. VIII.—A DREDGING EXCURSION IN THE GULF STREAM.

We had arrived in the harbor of Havana on the 24th of February last, with the intention of leaving almost immediately on a cruise, the chief object of which was to make deep sea soundings along the northern coast of Cuba and on the Bahama Banks. The steamer Bibb, of Coast-Survey renown, honorably known both in times of peace and times of war in almost every port of our Atlantic coast, was punctual to her appointment, and met us on the morning of our arrival. Transferred to her comfortable quarters, cordially welcomed by her captain and officers, and with the stars and stripes above us, we felt that it mattered little to us personally whether the city of Havana was in a state of seige, as the New York *Herald* reported it on the day of our departure, or whether it was, as we actually found it, as quiet as a New England Sunday with no other indication of disturbance than its unusual stillness, perhaps like the dead calm which precedes one of its own tornadoes.

Before starting on our exploration, however, there were certain official preliminaries to be settled. In the existing state of politi-

cal disturbance, when every strange vessel was looked upon with suspicion, it was thought best that Mr. Agassiz should see the Captain-General and request the prermission (most graciously granted, by the way) to make surveys in Cuban waters and enter any Cuban ports unmolested. This matter settled, we should have sailed immediately; but the work of sounding and dredging is peculiarly the sport of the winds and waves: nothing can be done in a rough sea, and an obstinate "norther" now set in, and held us unwilling prisoners for several days.

All the amusements which usually make Havana so gay were interdicted. There was nothing to do but to talk over the insurrectionary news, to watch the going and coming of troops, or to drive occasionally around the city or out to the Botanical Garden, excursions of any length into the country being considered unsafe. The Botanical Garden is said to have been well kept formerly, but it is now in a state of complete neglect; the tanks and artificial streams dried up, the water-plants decaying, the growths tangled and ragged. The Alley of Palms remains its most beautiful and characteristic feature, but it does not compare in height and grandeur with that of the Botanical Garden in Rio de Janeiro.

At night, sitting on deck, we watched the wonderful phosphorescence of the harbor. So luminous was the water that every living thing within it was visible. We could count the rhythmical pulsations of the jelly-fishes by the rise and fall of a dim silvery glow which surrounded them; we could track the swift dart and whirl of the shrimps by sudden flashes of light; and every now and then a large fish coming to the surface would scatter a glittering foam for a yard and more around him. Every little boat carried its trail of light, and scattered golden spray from its oars. On examination the water was found to be full of animalcules, which are no doubt the chief source of the light, though it is partly due to a less pleasing cause, namely, the rapid decomposition of animal matter in the harbor. This accounts for the diffuse and spreading, but duller, glow which mingles with the more sparkling and vivid light.

At last, after a few days' delay, we were off, with a favorable wind and a smooth sea, skirting the northern shore of Cuba

dredging and taking soundings as we went.* The dredge was thrown for the first time some ten or fifteen miles east of Havana, at about two and a half miles from land, in four hundred and sixty-five fathoms of water. I confess that, when the dredge was first thrown over the side of the vessel, I waited for its return with the impatience and curiosity of a novice, saying to myself, "What will it bring us from the deep sea?" Little or nothing this time but the dead. Yet its contents were not uninteresting. Of the pretty transparent shells of the Hyalæa, like little bubbles of blown glass, purple or brownish in tint, there were four species; there were white Atlantas (Heteropods), resembling minute Nautili in appearance, though quite unlike them in structure, and a little Cledora, formed like a three-cornered beech-nut, but pure white in color; besides these there were the wrecks of barnacles (Lepas), some joints of a coral (Isis), and a Cuvieria. But of living things there were none except a marine worm, and a hermit crab protruding his bright red claws from the tiny shell where he had made his home, little thinking to be disturbed, at least by any fishermen of the upper world, this peaceful morning, some two thousand feet below the surface of the sea. The next time we were more successful, the dredge being thrown in nearly the same locality, but in shallower water,—the sounding giving only one hundred and fifty fathoms. It brought up living Gorgonias† (Fancorals), their delicate branches of a pale rosy hue, the stem here and there thickened by the growth of a small sponge upon it. As it lay in the glass bowl, separated from the mass of things which came up in the dredge, the different members of this pretty compound coral were in every degree of contraction and expansion. Seen through the lens, they were singularly like the buds of the Calmia (mountain

* Wishing to give as impersonal a character as possible to this little sketch, I speak of the work in general terms, but it may not be amiss to say a word, in the outset, of the division of labor. Mr. Agassiz's share of the work, in connection with his friend, M. de Pourtales, whose previous investigations of this kind have given most valuable results to science, was simply to direct the dredgings. Captain Platt, the present commander of the Bibb, was continuing a hydrographic survey on the Florida Reef and neighboring coasts, which have been ably conducted by him for several years past.

† Acanthogorgia.

laurel). Across this branch rested a bit of glass-coral (Hyalonema), transparent, and hollow like a broken pipe-stem. Besides these specimens there were minute Crinoids, the crown not more than an eight of an inch in length, Feather-stars, Terebratula, stalks of Isis, Sertularians in plenty, and also a bit of glass-coral growing from a little sponge. And so, with varying fortune, we kept on our way, stopping at short intervals to sound and dredge; sometimes with no return at all; sometimes only a broken net, with a few small fragments of coral hanging to the frame of the dredge, telling us that perhaps we had lost some large coral mass which would have been a treasure, but which was heavy enough to burst the meshes in which it was caught. In this work there is many a slip between the cup and the lip; a strong current, an adverse wind, a rough sea, any untoward incident, however slight, is enough to disturb the apparatus and make success impossible.*

A word about the apparatus itself may not be out of place. The dredge is a strong net, about a yard and a half in length, surrounded by an outer bag of sail-cloth. Both are open at the bottom, but laced above, around an oblong frame of iron. This frame has two arms, with a ring at the end of each. One of these arms is securely fastened to the line by which the dredge is let down; but the other, instead of being attached to the line, is simply tied by a weaker cord to the first. This is in order that, in case the dredge should be caught on the bottom, as often happens, one of the arms may give way, allowing it thus to change its position slightly, and be more easily freed. It is an important precaution; for sometimes the dredge is caught so fast that it requires not only the force

*Dredging in great depths is a slow and rather tedious process, requiring not only patience, but very accurate observation. M. F. de Pourtales, of the Coast Survey, has been engaged on board the Bibb for the last three years in making dredgings in the Gulf of Mexico. These dredgings have included every variety of depth, from the shore outward to soundings of six, seven and eight hundred fathoms, eight hundred and sixty fathoms being the deepest. They have brought to light the most astonishing variety of tiny beings—especially crowded on rocky bottoms, but not altogether wanting even in the deepest mud deposits. A report of the results obtained in his first two years' dredgings has been partially published by M. de Pourtales in the Bulletin of the Museum of Comparative Zoology at Cambridge. They form a most valuable contribution to our knowledge of the animals existing in the deep sea.

of the small engine to which the reel, holding seventeen hundred fathoms of line, is attached, but the additional strength of all hands on board, to disengage it. When the dredge is lowered—being, of course, weighted, so as to sink rapidly—a cord is tied around the bottom of the net, while the sail-cloth is left open, thus allowing the free escape of water from the former, while the sail-cloth protects it from injury. When the dredge is landed on deck, a tub or bucket is placed under it, into which all its contents fall the moment the cord around the bottom of the net is untied. Sometimes a large tub is filled at one dredging with all sorts of living specimens—shells, corals, shrimps, barnacles, sea-urchins, star-fishes, polyps, sponges, and sea-weeds, with all their natural brilliancy of tints.

On the second morning, having passed Mantanzas in the night, we found ourselves off Cruz del Padre, a lighthouse station situated on a part of the coast where islands and shoals make navigation dangerous. The day before, the shore had presented a gently rising slope, consisting, so far as its geology could be made out with a glass from the deck, of marine dunes consolidated into a conglomerate limestone. Behind this was a broken, picturesque range of hills. But now we were anchored in front of a line of low, flat islands, like the Florida Keys, divided from each other by open channels. Midway between our ship and the islands was a coral reef, invisible to me, but revealed at once to the initiated by a dark, purplish band in the water. Immediately after breakfast the boat was manned, and we started for an exploration of this reef.

It was a delicious morning, with a light breeze stirring, which made the heat endurable. As we approached the reef, coming into comparatively shoal water, its beauty gradually unfolded. The water itself, wherever it flowed over a sandy bottom, was of a wonderful color, like the green of an emerald when the light strikes into it, and gives you its palest, purest tints. A few more strokes of the oar brought us immediately over the reef, in a depth of three or four feet—and it would indeed be difficult to describe what we saw. Here and there upon the floor, which lay spread out beneath us like a picture, were huge coral heads, each one a world in itself. Lovely sea-anemones were growing upon them,

two or three inches in diameter, with all their plumy green tentacles fully open and softly stirring in the water. By their side were tiny sea-fans, not more than a finger in height, while others much larger, purple, rosy or green, might be seen at various distances. I had always heard of the beauty of the living world under these transparent seas, but I had no conception that it would be so absolutely clear and distinct. We had with us a water glass, which seemed to bring the bottom still nearer. It is nothing more than a square wooden tube, with a glass plate in the lower end. Sinking this under the water and looking through it, all the undulations of the surface, which distort objects below, are lost, and nothing obstructs the vision. Seen through this simple apparatus, the sea bottom, or rather the summit of the reef above which we were floating, was like the most exquisite aquarium, the contents of which were ever shifting. We could see numberless little fishes swimming in and out between the blades of the sea-fans, among them the bright-colored parrot-fishes, their vivid blues and greens coming out in strong contrast against the white coral sand. But while I looked and admired, the collecting was going on. P——, who is an old hand at the work, and had come in what he calls his diving-costume, plunged over the side of the boat and walked off up to his waist and presently up to his neck in water, striding about as much at his ease as if he had been on land. Every now and then he disappeared with a sudden dive, nothing but an occasional view of his heels, or his hat, floating, innocent of a head, somewhere in the neighborhood, giving any idea of his whereabouts. From these submarine excursions he usually issued like a very sea-god, bearing perhaps an enormous head of coral, some two feet in diameter, which he had dislodged with an iron crowbar carried in his right hand. Staggering to the boat under his heavy load, presently he was off again, returning from time to time with ever new treasures—great cups of the Madrapore; huge masses of Mæandrina, bunches of the crimson Stylaster roseus, a bright red coral growing generally on dead coral rock; fragments of Mammilaria, of Porites and countless other corals, some already known to Mr. Agassiz, others new. Our young friend G—— followed him, and was also busy in collecting; while the boatmen,

catching the fever, plunged into the sea, or with a net tried to entrap whatever came along. In the meantime the Professor remained in the boat, and, aided by the captain, examined and stored away the specimens which arrived almost too fast to be properly cared for. They broke up some of the larger masses of rock, and found them full of life. Besides the corals of various kinds growing over their surface, the interstices were full of animals. Sea-urchins and star-fishes, frightened by the commotion, crept out of their holes and offered themselves to the spoiler. Worms, so long that you wondered where their soft folds were hidden in what seemed solid rock, uncoiled themselves and dropped from secret recesses. Little crabs scuttled away, but were caught as they made their escape, and imprisoned in one or another of the jars or buckets standing in the bottom of the boat, and now nearly full. At last, after passing a couple of hours on the reef, we rowed to the shore of the nearest key. Here was a protected harbor between the reef and keys, which we looked at rather longingly, thinking, were there only a channel deep enough for the Bibb to cross the reef, how comfortable an anchorage it would make in case we should be caught by a "norther" outside. The shore presented nothing but a beach of coral sand, and a low shrubby growth coming almost down to the water's edge.

We returned to the ship laden with treasures; and, once more at home, the naturalists were very busy assorting their specimens, and, after watching them awhile in their living condition, preserving the smaller ones in alcohol, and disposing the larger coral heads and fans on the deck for drying. The Mæandrina, or Brain Coral, is one of the most beautiful. The bleached specimens exhibited in museums give no idea of its appearance when living. Between all the ridges which make the undulations, so familiar to us in the dead coral, the furrows are filled in with a green floor, soft as velvet, delicate as moss. In this green floor the mouths of the different animals are set, surrounded by tentacles of the same color, outside of which, like a paler row of tentacles surrounding the first, are lasso cells, their internal coils being plainly visible with the lens. Outside of these soft parts are the waving brown ridges which border the furrows, and by their winding contour give this

coral its resemblance to the human brain. There are other species in which the filling of the furrows is gray, but those with the green floors are much the prettiest. We brought home many fragments of Porites also. It seemed a pity to take them from the sea, where their greenish-yellow tufts look so soft that one can scarcely imagine them to be hard and rigid in structure. When placed in deep bowls filled with sea water, they soon recovered their beauty, however, and we could watch the twelve tentacles, which form the summit of every member of such a community, creeping gradually out till each one had its crown. So also with the Madrepores; they folded in all their soft parts when taken from the water, but, being restored to their native element, began to expand again; the tentacles, which in this species are divided into six smaller and six larger ones, being fully extended in some, though only partially visible in others. Many of our specimens borrowed brilliancy from a crimson growth around the base, which we supposed to be sponge.

From Cruz del Padre we crossed in a northeasterly direction to Salt Key Bank, an extensive and very level rocky shoal, coming to the surface only here and there. We anchored the next morning off Double-headed Shot Key, or Elbow Key, as it is also called, a narrow ridge of dangerous rocks on the northwest corner of this bank. Here our good fortune in the way of weather deserted us; heavy clouds to the north had given us unpleasant warning the night before, and the "norther" now began to blow in earnest. Notwithstanding the high wind and rough sea, we went on shore after breakfast in a boat. No beaches fringe these steep rocks, which turn a vertical wall to the sea, but a flight of steps cut in the stone gave us easy access to the land, and here the light house keeper met us, with his family. This barren strip of rock, swept by the sea, where not a square yard of soil has a foothold, is a home. Anchored in midocean, sometimes not seeing in the space of three or four months a soul beside each other, there live here a man and his wife, with a family of bright, intelligent children. I could not but pity the young people growing up in such strange solitude and in such dreary scenes. Even walking with much pleasure is denied them. Elbow Key is a ridge of rock, about fifty feet above the level of the sea in its highest part, some quarter of

a mile in width, and perhaps a mile in length; the surface is so broken, cut, and gnarled in every direction that walking upon it is not unlike walking over broken bottles. It is worn also into deep pot-holes, into which you are constantly in danger of falling, and in many places is pierced through its whole thickness by deep caverns and tunnels. Kneeling on the edge of these singular excavations, which are often at a considerable distance from the shore, you see the water boiling and surging beneath you, and hear the moaning of imprisoned wind and wave, while every now and then a blinding eddy of spray is forced up into your face. The wife of the lighthouse-keeper told me that when she first came there, six years ago, these strange subterranean noises possessed her imagination; combined with the raging of storm and sea without, they added a mysterious element of terror to the situation. Now, she said, she was accustomed to them. I suggested to her that she might have some little garden ground, to give occupation to the children and cheerfulness to their home. "Garden!" she exclaimed; "why, ma'am, if one of us should die, there is not soil enough to dig a grave, unless for my little two months' baby here." It was a rather ghastly, but very expressive way of putting the case. This man receives from the English government for his services here about four hundred dollars a year, and his rations, consisting, they told me, of little besides salt meat and potatoes. They complained bitterly of the want of books. They said that to most lighthouses, especially in such lonely situations, a library was attached, and they had petitioned for one, but without success. We had taken on shore with us a few books and papers, which they received with hearty gratitude. Indeed, the Bibb and her officers were old friends to them, the vessel having been anchored on the same spot a year before, for a few days.

We walked over a great part of the island, sitting down from time to time to watch the breakers as they drove in upon the rocks and broke in clouds of spray against them. The strip of rock on which the lighthouse stands is separated from the rest of the ridge by a narrow channel. The whole ridge consists of rounded masses, in some parts only slightly lifted above the sea level, at others rising from twenty to thirty and fifty feet in height. The geology is curious. The whole key is formed of limestone, the strata dipping at various angles in different directions; but the

surface is, as I have said, worn in many places into pot-holes, which have again been filled by more recent formations, and these in their turn eaten away, leaving a mere shell lining the original excavation. In Mr. Agassiz's notes, taken on the spot, he says: "Double-headed Shot Key is a long, crescent-shaped, rock ridge of rounded knolls not unlike *roches moutonnees*, at intervals interrupted by breaks, so that the whole looks like a dismantled wall, broken down here and there to the water's edge. The whole ridge is composed of the finest oolite, pretty regularly stratified, occasionally torrential, the stratification more distinctly visible where the rocks have been weathered at the surface into Karren. The uniformity of the minute oolites leaves no doubt that the sand must have been blown up by the wind and accumulated in the form of high dunes before it became consolidated. The rock is very hard, ringing under the hammer, and reminds one of the bald summits of the Jura, such as Tete de Rang, near La Chaux de Fond."

The next morning, Sunday, the 7th of March, neither wind nor sea gave any indication of subsiding, and as it was not worth while to cross the Gulf to the Florida Reef in weather which precluded all possibility of sounding or dredging, Mr. Agassiz proposed to Captain Platt that we should run down to Salt Key, about fifteen miles to the south of Elbow Key, that he might have an opportunity of taking another geological ramble, and comparing the formation of the two keys. To this the captain readily acceded, and we started forthwith; but as it happened we found there was a Sunday's work before us very different from that we had projected. We were well on our way, when the captain with his glass thought he descried a schooner aground, on a shoal called the Lavanderas, to the east of Salt Key. Determined to go at once to her assistance, he changed his course, and, in abont an hour from the time she was first seen, we were alongside of her, or at least as near as it was safe to go. There she was—a fine schooner, fast in the rocks, and likely to be knocked to pieces on them before long with such a sea as was now running. A boat was dispatched to her immediately: and to me, who am but a land-lubber, or at least an ardent land-lover, her course looked perilous—bobbing up and down like a cork, lost in the waves one minute, and half out of water the next. Having reached the vessel, a rope was thrown to her, and she was drawn near enough for the captaiu to jump in. He came

off to consult with Captain Platt as to what was best to be done under the circumstances. He was bound from New York to Havana, in the schooner Americus, and had had a prosperous voyage until the preceding evening, when in attempting to cross the Bank he had run upon the shoal a little after sunset, and had been lying there all night. He knew the position of the Lavanderas, and had taken his course so as to give them a wide berth, but had been unconsciously drifted astray by one of the treacherous currents which are the seaman's dread in these waters. Since the schooner struck, a Spanish wrecker had been hovering about her, but the sea was so rough that she could not come near enough to render efficient assistance; and indeed the only help she offered was to lighten her of her cargo of potatoes, charging for the service seven hundred dollars, which naturally enough the captain declined to give. She had now retreated, and was anchored under the shelter of Salt Key. Captain Platt advised throwing overboard at least a part of the cargo, and then, with all sail set, trying to drive the schooner over the shoal. He sent the captain back in our boat, with as many men to help in the work as he could spare, and presently the sea was strewn with barrels, hogsheads, and boxes of all shapes and styles. She was laden with cement, potatoes, empty hogsheads, to be filled with molasses at Cuba, lumber, and other miscellaneous matters. Lightened of her load, and the sails set, she began to give signs of life; she stirred, changed her position a little, and after a few moments of suspense, floated and moved on.

There was an exclamation of delight from all the watchers on our deck, but they were presently checked; for, as she passed us, so close that the two vessels almost touched, we saw that her rudder was gone, and the boat returning with part of our men reported that she had large holes in her bottom, and was filling fast. Meanwhile, under full sail, she was moving off rapidly, somewhat to our anxiety; for who can tell at what moment or how suddenly a sinking ship may go down, and she had not only all her own people on board, but four of ours. We got up steam and followed in all haste. Again within hearing distance, by means of much calling through speaking-trumpets, till both captains were hoarse, the master of the schooner made it understood that, notwithstanding his crippled condition, he intended to keep on to Havana. "How can you," shouted Captain Platt, "without a rudder?" "I'm going to hang my rudder," was the answer; "stand by me while I do it."

"But your rudder is gone, look over and see for yourself." Up to this moment he had supposed his rudder only unhung; but having satisfied himself that it was actually lost, he accepted Captain Platt's offer to tow him under shelter of Salt Key, and there see what might be done further.

The day was already far gone, and, having secured the crippled vessel to our own by a hawser, we proceeded to our anchorage. It offered little shelter, being only a roadstead, deriving some little protection from the low, barren island which served as a sort of breakwater against the force of the sea. Consequently, we tossed about, almost as if we had been in the open ocean. Once at anchor, Captain Platt sent a boat again to the Americus. He would gladly have taken all her crew on board at once, and had indeed but little hope that she could last till morning. The master of the schooner, however, still held to the resolve not to abandon his vessel except in the last extremity, and intended to pass the night in the attempt to rig a new rudder. He hoped to keep down the water by means of the pumps; and, should she be afloat in the morning, he would attempt to reach his destination. Captain Platt promised to stand by him during the night; and having done all in his power to help him while the daylight lasted, he agreed with the captain of the Americus that, should the disabled vessel need assistance before morning, she should run up a red light.

It was a rough night; the wind was loud, and all the noises which sound alarming at sea in the ears of the uninitiated were abroad. I confess that I was not insensible to their influence. It was still dusk when I heard one of the men come to the captain, who was lying down in the adjoining cabin, and tell him that the red light was up. He was out in a minute, and, as it was impossible to lie there and think of the sinking ship, I followed as soon as I could to the deck, where all our company were already assembled. The poor schooner was plunging head-foremost into the sea, the water breaking violently over her forward decks, and in the dim light we could see two or three of her crew, aided by our own men still moving about her, trying to save instruments, papers, charts, and such personal effects as might be rescued at the last moment. But she sank faster; one by one the men dropped from her stern,

which was still out of water, into the boats below, and at last, the captain, not too soon, followed them. They rowed off, but, before they reached the Bibb, the Americus staggered over, and lay upon her side, with the surf breaking across her. It was a sad sight to see. She looked so like a living thing, and she seemed to fight so hard for her life, struggling with the waves to the last minute! Indeed, the whole scene was dreary in the extreme. The sun was rising, but without glow or color, shedding only a gray cold light over the waste of waters and the slowly dying wreck. However, we could not be too thankful that no lives were lost, and the rescued men themselves seemed to think they had more cause for gratitude than despondency, remembering what might have been the end had they remained on the shoal another night.

During the rest of that day, and the following night, we lay off Salt Key, awaiting the repair of our rudder, which was found to be badly split. In the meantime we had a dredging or two, not very rich in results, and Mr. Agassiz went on shore with a party from the ship to examine the key. His notes give the following report:

"The whole formation known as Salt Key Bank, and lying between Double-Headed Shot Key, Salt Key, and Anguilla Key, is a level bank covered by from four and a half to six fathoms of water, flowing over a fine sandy bottom. This sand is a result of the decomposition of corals reduced to oolites of varius diameters, from fine powder to coarse sand, mingled with broken shells, among which a few perfect specimens are occasionally found. Upon the edge of the bank, which everywhere dips very abruptly and steeply into deep water, there are at several points rocky ridges, and at others sand dunes rising above the sea level. A close comparison of these formations shows, however, that they are only different stages of the same process, representing various degrees of progress in the accumulation, consolidation, and cementation of the same materials. On the flat top of the bank, that is, on the level surface lying between the islands or keys, and completely under water, the loose materials are pounded down to fine sand. In course of time this sand has been thrown up upon the shoalest portions of the bank, these shoaler portions lying upon its

very edge, along which coral reefs have been formed. These coral reefs have thus become the basis for those parts of the margin of the bank which are now lifted above the water, as Elbow Key, Salt Key and Anguilla Key. It has occurred to me, though my data are too few to form the basis for a positive result, that in this bank, with its marginal islands, we see the beginning of something corresponding to the Athols of the Pacific ocean. Should the growth of the reef, in the course of time, lift the whole edge of the bank above water, as it has already done in some places, the enclosed area would then be surrounded by a ring of dry land, similar to the circular coral islands enclosing quiet waters in the Pacific, the formation of which has been so admirably described by Darwin.

"The formation rock resulting from the accumulation of loose materials above these reefs consists of a conglomerate of coarser oolite, rounded fragments of coral or broken shells, and even larger pieces of a variety of corals, and of 'Strombus gigas,' the larger conch-shell. The latter are so numerous that they give great solidity and hardness to the rocks. All the species are those now found living upon the bank, among which the strombus is the most common. Among the corals, Astræa, Siderina and Mæandrina are the most prominent ones. The stratification is somewhat irregular, the beds slanting toward the sea at an angle of abont seven degrees. Above this foundation rock immense masses of loose Strombus, dead shells and corals have been thrown in banks or ridges, evidently the beginning of deposits similar to those consolidated below. There is, however, this difference between them; namely, that while the foundation rock is slightly inclined and never rises higher than the level of high-water, the loose materials thrown above the water level are heaped in steeper ridges, varying from fifteen to twenty, or even thirty degrees in slope. These ridges are due to the action of high tides and unusual storms. In Salt Key they make a foundation for the accumulation of finer sand driven over them by the wind, and forming high sand dunes, held together by a variety of plants, among which a trailing convolvulus (Batatas littoralis), various grasses, and shrubs, are the most conspicuous. These dunes rise to nearly twenty feet in height.

On their leeward side, almost to their summit, there grows a little palmetto. The sand of the dunes is still loose, though showing here and there a tendency to incrustation at the surface. Their slope is rather steep, sometimes over thirty degrees, and steeper to the seaward than on the landward side. In the interior of Salt Key there is a pool of intensely salt water, the surface of which has a pinkish or flesh-colored tint, due to the immense accumulation of a microscopic alga, and is edged all around with the purest white foam. Along the outer edge of the area occupied by this microscopic plant, it forms large cakes not unlike decaying meat, and emitting a very offensive odor. The foundation rock of this key corresponds exactly to what Gressly has described as the 'facies corallien,' of the Jurassic formation, while the deposit in deep water, consisting of muddy lime particles, answers to his 'facies vaseux.'"

"Having completed the work as far as the weather would allow at Salt Key, and the rudder being temporarily repaired, the captain determined to return to Elbow Key. He had lingered at Salt Key, partly in the hope of giving the master of the schooner an opportunity of returning to the wreck, which still lay with her masts above water, in order to cut away the sails and such of her rigging as he could save. Her captain was also partly her owner, and we felt the strongest sympathy with him, for the vessel was not insured and the pecuniary loss was total. But the sea was so rough that it was unsafe to approach her, and the Bibb rolled and tumbled about so uncomfortably that it was thought best to seek a more quiet anchorage.

As we approached Elbow Key, on our return, the scene was picturesque and beautiful. Both wind and wave had moderated now, but the "norther" of the last two days had blown up a furious surf. On the further side of the key the waves were rolling in magnificently; breaking over the very summit of the ridge, they poured down in foaming cascades to the sea. The caverns, or spout-holes, as they are called, were throwing out white columns of spray, rising perhaps some twenty or thirty feet into the air. They seemed to start from the very rock, for many of the openings from which they issued were almost at the top of the ridge. There were

three, placed so close together that the same rise and fall of the sea affected them simultaneously, and their three jets of foam rose at one moment, often meeting and mingling before they fell. Even where we were anchored, half a mile from the shore, we could hear the booming and the roaring of the surf in these holes. Before night the clouds cleared away, the sun came out over the glittering spray, and the sea took on a mantle of many hues, changing from green and blue to softest amethyst and purple.

The afternoon was not lost for work. As the swell had subsided considerably, half a dozen fishing-lines were rigged, and we caught a number of fish which seemed to have borrowed their brilliancy of color from the sea. Meanwhile Mr. Agassiz and Mr. Pourtales dredged from the deck and brought up a variety of specimens—a little cuttle fish not more than a quarter of an inch long, with bright spotted body and black eyes ringed with gold; feather-stars of various colors, little scarlet crustacea, a minute sea-urchin hidden away in a bit of coral rock, exquisite rose-colored hydroids growing on a crimson base; such were some of the treasures we found off Elbow Key; farewell gifts as it proved, for the next morning we bade it good-by and started for the Florida Reef.

The sounding and dredging were continued at intervals all day. The first dredging to the west of Elbow Key, in three hundred and fifteen fathoms, gave as rich a harvest as we had had at any time, including exquisite living corals, growing not in communities, but singly. Perhaps the most beautiful of all was a "Desmophyllum." Of these there were several, their white cups, very slightly tinged with rose at the base, tapering to a delicate stem. They resembled small morning-glories, and looked, indeed, more like flowers than like animals. The tentacles were of a rich chocolate brown, and lay at first folded against the inner surface of the partitions; but when extended they stretched beyond the margin of the cup, and their soft feathery edges moved gently in the water. There were other corals in this dredging, also single, and almost as pretty as the "Desmophyllum," though smaller. I observed especially the Thecocyathus—the cup about the size of a pea, white outside, salmon color verging on orange within. One was delicately mounted on a small shell, the prettiest thing to see in the world.

Then there were very minute sea-urchins, the disc not more than the fifth of an inch in diameter, but the spines three times that length; crustacea of various kinds and very brilliant hues; star-fishes, especially ophiurans, and countless other dwellers in the deep sea.

That night we anchored in the quiet waters of Ship Channel, between the reef and the Florida Keys, and the following day, about noon, arrived at Key West. The little town, with its gardens of cocoa nut, palms and oleander trees, in full bloom, looked very peaceful and quiet, after our late experience at sea. Our shipwrecked mariners were fortunate in finding opportunities for an immediate return to New York, a passage being offered to the captain and mate on board a steamer leaving that very afternoon, while the crew took service on board other vessels. No sooner had the news spread of the loss of the Americus, than four or five wreckers started, like so many vultures, to prey upon the corpse. They returned, after about a week's absence, having actually collected something over a thousand dollars' worth of rigging, sails, etc., which were sold in Key West. This pursuit bears an ill name from old associations; but it is now a perfectly legal and systematized business, though a much less profitable one than it used to be in old times, when the absence of lighthouses along the reef made accidents far more frequent. The captain's only hope of saving any part of his vessel and cargo, in those days, was in allowing himself to be fleeced by the wreckers, who charged an enormous price for their services. Now a court of adjudication settles all disputes, and the wreckers assert that their occupation is one which protects, rather than endangers, the interests of commerce and navigation. Yet it may be doubted whether a business which is exclusively based upon other men's misfortunes can ever have a very benevolent character.

So ended our rather stormy and not uneventful cruise; full of interest for the naturalist, who rarely has an opportunity to study, in their living attitudes and natural colors, the animals which inhabit the deep sea. After a few days spent at Key West, while our coal and supplies were renewed, and certain slight repairs made on the Bibb, we started upon another excursion of the same kind, an account of which will be found in a subsequent number.

ARTICLE IX.—SILK AND SILK MANUFACTURES.

REPORT OF THE UNITED STATES COMMISSIONER TO THE PARIS UNIVERSAL EXPOSITION.

APPARATUS USED IN THE MANUFACTURE OF SILK.

(*Chapter II—Continued from November No.*)

TOOLS OR STOCK NECESSARY TO TRANSFORM THE COCOONS INTO RAW SILK.

France and Italy are the only countries which have exhibited the apparatus necessary to transform the cocoons into threads of silk. These are the most advanced in the whole of Europe in this specialty.

The industry of Spain, of Greece, of the Levant, and of Russia, has imitated as much as possible the means used in France and Italy. Those countries have not, however, been able to arrive at the perfection of their neighbors. As to the Orientals, they lose a part of the advantages which their privileged climate gives them in regard to the production of silk by insufficiency of care and skill in details.

The implements, properly so-called, for converting the cocoons are most simple in all countries of the world. They consist principally of a basin and a reel. The basin is used to receive the cocoons and some warm water to soften the gum of the silken envelope, so as to set free the threads forming the exterior silky layers. The union of a certain number of these threads forms the thread of commerce known by the name of *grege*, or raw silk.

The reel, by its rotary motion, winds off the cocoons. In the factories certain numbers of these winding machines are placed side by side, the impulsion being given to them by a single motive power. Of course the arrangement is such that the operator can, at will, stop any of these little contrivances while the others continue to work. The entirety of the operation is automatic, except that in regard to each reel we find a basin and a woman to superintend the work. The labors of the superintendent consists—

1. In the immersion of the cocoons in the warm water until the silky layers are sufficiently softened.

2. In the cleansing, with a species of brush or broom, of the first layers until they become a pure and clean thread.

3. In the uniting by pressure and twisting a certain number of threads of the cocoons in proportion to the standard of raw silk intended to be produced.

The *grege* thus formed by the union of a greater or less number of cocoons is passed through an orifice or drawing frame, which acts on the winder, whose rotation determines the development of the threads of the cocoons which remain immersed on the surface of the water in the basin, so that in proportion as the cocoons are wound off the attendant is careful to add a new one, as much to keep up a supply of thread as to maintain the regularity of the standard.

The cocoons being conical from the commencement to the end of the winding, the *grege* would have the greatest irregularities if the workman did not conduct his work so as to connect the strongest, that is to say, the commencement of the thread of the new cocoon, with those which are just being exhausted.

The threads issuing wet and gummy from the basin, would adhere and stick together in the skein if careful means were not taken to prevent it. The preventive consists first in preserving a sufficient distance between the basin and the reel, to permit a partial drying; and second in a "guide thread," so arranged that the transport takes place by a slow zigzag movement, which prevents the threads from crossing each other at the same point at each turn, which latter causes the adhesion.

Some suggestions will assist us to understand and to obviate the difficulties in this branch of the work.

The degree of previous preparation should vary with the durability of the silky couches, having regard to the age, breed and origin of the cocoons.

If prepared too much, the result would be that more silky matter would be yielded by the first layers than there should be. This superfluous matter would be only waste, and would possess a value much inferior to that of fine silk.

If the cocoons are, on the contrary, insufficiently prepared, they present a resistance to the winding off, which causes the breaking of the thread and leads to a new source of waste. The workman ought to possess great skill in joining a new thread to the thread in work. He should be competent to select the most opportune moment to assure the regularity of the product, so that the trace of these successive connections may be imperceptible to the eye, and thus avoid knots, coarseness, curls or dots.

Nor will rare skill in these particulars produce the effect desired, unless the wheel revolves with a fixed and steady velocity of at least 500 metres per minute. Without this the thread, instead of being smooth and brilliant, would be rough and dull.

A too slow movement would not dress the thread sufficiently, clasped as it is very tightly by its peculiar position and fixed under the form of the figure 8 in the layers of the cocoons. A movement too slow causes those undulations which give the dull appearance; while the development of the thread in the straight line by the more rapid movement permits the reflection of the light in those perfect and determined conditions which give brilliancy to the finest silk.

We have entered somewhat at length into these details, because they will assist us to discover the many difficult sides of a question of apparent simplicity, and will enable us the better to understand why the more perfect development of this industry remains concentrated in the hands of some populations, and why automatic labor has not been able, till now, to bring about these elaborate and exquisite modifications in silk which have been produced in other textile fabrics. But, if converting the cocoons into raw silk in a successful manner be due to local circumstances, such is not the case with the industrial specialities which follow it, commencing with the throwing or spinning of the silk.

Almost all European nations were represented at the Exposition by the different mechanisms employed in the silk manufacture. Let us take a glance at the machines of this character. We will first speak of the machinery used to sort and dress silk badly reeled, and it may be well to enter into some details on this subject, as it is one that particularly interests the American manufacturers.

Silk of the first quality being actually as dear as silver,* ought to be employed only in the best and most perfect conditions, especially when it is intended to produce fabrics like those so much admired at the Exposition, and among others the truly artistic silks of Lyon. Different means have been devised to determine the standard of the silk thread If it be pure, it will have the degree of solidity and tenacity desired. The manufacturer is particularly ingenious in constructing apparatus to rectify, sort and dress silks of irregular standards.

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*In spite of the high price and the crisis in silk husbandry, silk costs much less than in the time of the Romans. The Emperor Aurelian refused a silk dress to his wife, assigning as a reason that it was too expensive a luxury even for a Roman empress, silk then being sold for its weight in gold, pound for pound.

APPARATUS TO SORT, TO PROVE AND TEST THE QUALITIES AND PROPERTIES OF SILK.

Silk thread has more need to be sorted or numbered than the thread of other substances; the sorting or numbering is to determine the relation of the unity of weight to the unity of length. For silk the unity of weight is generally the *denier* or fraction of the ancient *livre* of Montpellier, and the *denier* is equivalent to 0.53 of the *livre*.

The unit of length is 400 *aunes*, representing 475 metres, or 515 yards. Thus, when w say a silk of 8-9 *deniers*, we mean that a thread of it of 475 metres of length weighs from eight to nine *deniers*.*

Efforts are being made to modify this standard and to substitute the unit of 500 metres for the 475 metres, and the milligram for the *denier*, in order to make the system conform to the metrical system.

The rectification of the standard of silk seems to be more necessary than that of other valuable materials, because, from the manner silk is produced, we are far less sure to arrive at regularity than by the automatic process practised for the conversion of cotton, wool, &c.

Besides, as silk, from its nature and price, is intended for the dearest kind of products, the material employed in its manufacture ought to be so much the more perfect. The mode of *titrage* generally used in all periods consists in winding off a certain length, and the determination of the weight of this length. The less it weighs, the finer, of course the silk will be.

It is considered, for example, that if 500 metres weigh one milligram, it will be one-half more fine than if it weighed two milligrams, supposing always that its hygrometric and thermometric condition does not change during the operations. The same unit of length will weigh more, if it contains humidity, than if it be perfectly dry.

The public establishments of Europe, to ascertain the condition of silk, have for their specific object to determine, in an exact manner, the real state of the silk, its degree of humidity, and the absolute weight of this same foreign matter, as if the silk were perfectly dry.

Establishments of this kind, it is well known, exist in the principal manufacturing centres of the trade in silk and wool. They generally operate under the direction of the various chambers of commerce.

These means of control offer a great security to business, but unhappily they can do nothing to verify or establish the regularity of the threads.

The *titrage* gives, in effect, only the relation between the weight and the length, but indicates nothing as to the homogeneity of the thread. Each determinate length of a skein may have identical weight without the thread being regular. For example, if a skein of 10,000 metres presents an equal *titre* or standard for each 1,000 metres, that would not demonstrate that upon this length there may not be parts alternately coarse and fine. This effect happens much more frequently with the silks that are poorly worked, on account of their low relative price.

Some sellers in China, Japan and the Levant strive, with great persistency, to ascertain and rectify these irregularities of thread by the windings off. During this process, when the eye discovers the defects, they are removed by the hand; but this is a slow, expensive operation, and anything but sure.

The Swiss exhibition contained an automatic apparatus, which arrives much more efficiently and economically at the result sought for.

THE SILK SORTING APPARATUS OF G. HONNEGER SWITZERLAND.

This machine receives on the one part a series of skeins of silk. To each skein correspond a number of bobbins or reels, equal to that of the varied bulk supposed to be contained in the skein.

* Condition publique des soies et des laines, bureau de tetrage. Decret du 2 Mai, 1853.

The solution of the problem consists in collecting on each bobbin thread of the same fineness. Let us suppose five bobbins from No. 1 to No. 5. Each will receive the portion of the thread of the *titre* for which it shall have been designated. For this purpose the thread which is rendered from the skein to the bobbins is guided automatically by a mechanism for guaging, extremely sensitive, and so arranged that the *grege* or raw silk in passing acts upon a lever which directs the silk upon the proper bobbin.

The variation in the bulk of the product is the point of departure in the variation of the guide lever, which directs the thread to the reel proper to receive it.

A glance at the working of this apparatus enables us to understand it better than would the most elaborate description.

By the employment of this machine the cheap silk of the east can hereafter find still more extensive applications, and contribute to a new development in silk industry.

AN APPARATUS TO TRY THREADS BY PROF. ALCAN.

Another apparatus of great utility was exhibited by Professor Alcan in the French section. It is an instrument of rare precision, very simple, not expensive, and works with great facility. Its object is to test the tenacity and elasticity of filaments and threads, and to determine the degree of tension most suitable to be employed on any given thread.

The mechanism of this instrument, though not at all complicated, has been explained in detail, with its applications, by the inventor, in several works very popular in France, particularly in his treatise upon the textile arts, one of which is entitled "On Cotton Labor," and the other "On the Manufacture of Wool."

These works of M. Michel Alcan, Professor of the *Conservatoire Imperial des Arts et Metiers de Paris*, are to be obtained by the publisher, J. Baudry, Paris.

We name these works because they give a greater amount of information upon the production of raw material and upon the progress of this industry than any other works within our knowledge.

Near this machine at the Exposition is another apparatus called *Experimentateur Phrosodynamique*, to prove threads, and also a new machine to prepare and open cotton before the ginning, both the production of Professor Alcan. This eminent engineer has made, as we have seen, a special study of the industrial questions which are of such vast importance to the American people.

IMPLEMENTS AND APPARATUS USED IN SILK-THROWING.

The machines for "silk-throwing" seen at the Exposition have remained, as far as fundamental principles are concerned, in the same general condition wherein they were at the origin of automatic industry, but they have been improved in their details and in the harmony of their execution.

The Swiss manufacturers, especially, have exhibited a remarkable collection of implements in this department.

The assortment as thus exposed, and which is employed in the best factories, consists—

1. Of series of *tavelles* to wind, clean and equalize the threads during their automatic winding off.

2. Of an apparatus to unite and double the threads with a mechanism for instantly stopping the machine whenever a thread breaks.

3. Of a machine to give the first twist to the double threads in the direction determined for the production of the tram or woof.

4. Of a second machine to retwist together two threads already twisted separately, thus producing the organzine.

The object of these machines, so simple in their construction, is to obtain constantly an evenly twisted product—that is to say, worked in such a manner that each unit of length receives exactly the same number of turns.

Now the realization of this object was not effected without encountering difficulties which have been completely surmounted by the Swiss and French mechanicians, judging as well from the machines as from the magnificent threads exhibited.

This class of machinery is the more advanced because the machines to convert silk are of all others, the cheapest, and this results directly from their greater simplification.

The "throwing" the threads of silk has several objects in view.

1. It gives them a sufficient resistance to admit of their being boiled in soapy water to remove the gummy matter, so that they may receive the dye better and give greater brilliancy than if they had remained in the raw state.

2. By the ungumming the silk acquires the desired suppleness of silks called "boiled," while if it retained its gum it would be stiff and rough, like the silks employed in bareges, for example.

3. The throwing the silk is intended to give a certain peculiar appearance to the threads, which partly determines what is called the grain of the stuff.

Moreover, when these threads are intended for brilliant tissues, such as satins, the two successive torsions which constitute the organzine are combined in such a manner that the last, which will be the most apparent, should have the least twist in order to preserve the brilliancy of the stuff.

The combination is inverted if the object be to make threads for taffetas, gros grain-gros de Naples, &c.

The work of silk-throwing, by the combination of the varied conditions it requires, necessitates the possession of such accurate knowledge and the use of such rare skill as to constitute it a special art.

SIMULTANEOUS REELING AND THROWING.

It has been frequently attempted, and is sometimes still sought, to unite in one single operation the winding off of the cocoons and the throwing of the silk. Notwithstanding that for a long time the solution of this problem, which apparently presents no serious difficulty, has been considered as the philosopher's stone of silk industry, the effort has not been abandoned. Still in this department, as certain mechanism exhibited by the Italians and French attest, the problem offers but little interest or encouragement; as for example, to wind off the cocoons and twist the thread at the same time, the raw silk or *grege* in issuing from the basins, instead of being passed on to the reels by one simple movement, is rolled around bobbins having a rotary motion, in order to give torsion to the threads.

It is necessary to direct two of them together upon one bobbin to produce the tram; consequently the intermediate operations are all suppressed and condensed into one single process, and hence an apparent economy; but, in fact, this economy disappears and the new mode becomes comparatively expensive, because the production is considerably reduced, and because it requires a much larger personal attendance.

A few figures will suffice to demonstrate this. To produce the *grege*, the velocity most suitable is such that one workman throws out at least a length of 500 metres of thread a minute.

When the thread is twisted at the same time, only 500 revolutions are given per metre to it in the majority of cases. Suppose a velocity of 3,000 revolutions to the spindles, only six metres will be produced, instead of 500 a minute. It is true a workman can superintend four threads instead of one, but it will still be necessary to employ twenty times as many spinners in this case as when the production of the grege was in question.

Now this augmentation of expense is much more considerable than the economy realized by the suppression of the intermediate operations. But the most serious difficulty consists in the imperfection of the results. The slowness of motion in the simultaneous

twisting and throwing does not permit a suitable development to be given to the thread, nor a sufficient tension for the entire unwinding, which causes the dark aspect of the product already spoken of.

In a word, by the combination of different operations, the workman is not able to bestow upon his task that care in cleansing and purifying which is performed by the automatic system and by hand as it exists in careful silk-throwing.

Thus the apparent progress, so enticing in appearance, demands an expense much more considerable than that of the separate operations mentioned, and can only give inferior products of inconsiderable value.

In order that they may be forewarned, these facts are worthy of special notice by the American people, who are only beginning to turn their attention to this branch of industry.

However, all new attempts may reach ultimate success: and if it be true that for beautiful normal products the simultaneous twisting and throwing must be rejected, there are cases where they may be employed, and, indeed, where they begin to be employed with a certain success; as for example, when the cocoons are of an inferior quality, and difficult to wind off, such as double cocoons, so that the operator in twisting them directly can, at best, obtain silk of only a very inferior grade, fit only for working common *cordonnet* (braid, binding, twist, lace, &c.) In such cases the simultaneous process may be advantageously used. And, indeed, cocoons, wound and doubled and twisted simultaneously, in order to make directly from them certain products intended for *passementeries* or trimmings, have no need of such careful superintendence as would be required in regard to the same cocoons when intended to produce the more beautiful silks. A single person can attend a greater number of ends (or *bouts*), inasmuch as these coarse articles are far less liable to break.

There are then two conditions which permit the employment of the simultaneous system with advantage.

1. When the object to be attained is not an imperfect *grege*, but a *cordonnet* for trimmings, of a sufficiently good quality, and at a price relatively high; and, 2d, in cases where the expense of hand labor is considerably reduced in consequence of the character and destiny of the special product—one person under such circumstances being able to produce very much more than he otherwise would by the ordinary process.

PRODUCTION AND UTILITY OF SILK WASTE.

The different transformations undergone by silk, up to this point, and those it has still to undergo until it arrives at the state of "stuff," occasions "waste."

This waste presents itself in different states. Those resulting from the operations which precede the torsion offer parcels of raw filaments (*grege*) not twisted, known by the name of *frisons*, or waste from reeling cocoons.

There are *frisons* of different qualities, according to the period of preparation given to them, or according as they proceed from *cocons*, *degraines* or *percés*. In this case the waste is more particularly designated by the name *golette*, from which are made coarse silks called *fantaisie*, *chappe*, &c.

The waste proceeding from the different manipulations, commencing with the winding off of the *grege*, in the throwing, and the operations of weaving, is generally composed of twisted ends, and is known by the name of *bourre*.

These two sorts of *debris* have been long utilized. They are divided, cleansed, ungummed, and then equalized by cutting to prepare them for twisting, as we have already said. But there is another kind of waste, long neglected, and which has commenced to be utilized only since the very high price of silk, namely, the *chiffons*, or rags of this material. Establishments of this kind are very rare; one exists in England, one in France, and a third in the United States. We have no knowledge of any other.

As to the winding of waste, we must limit ourselves to pointing out a certain progress, of which threads of this kind have been the subject as well in France as in Switzerland.

NEW THREADS OF SILK BOURRE.

We have seen, in the show cases of the Exhibition of these two countries, threads from *bourre* (a sort of shoddy), which rival in the beauty of their appearance the most lustrous silks, and at one-half the price.

These results are obtained by attention to details in the manufacture. All these operations have attained remarkable precision, and have been executed conformably to the indications of science, and by the application of certain preparations under special conditions. When the threads have been produced with the greatest care from waste, well purified, well combed, perfectly prepared and spun, the workman then proceeds to apply a thin layer or coating of warm gelatine or isinglass to the thread when stretched and in motion.

The drying and ulterior *chenillage* completes the work, and imparts to the products that peculiar brilliancy so much esteemed, and that elasticity so indispensable to manufactures of this kind.

The unusual care and attention brought to the working up of waste have been necessitated, as we have said, by the rise in the price of this material. It is not many years since the waste, which at present sells at from 12 to 15 francs, was worth only four or five francs the kilogram.

This fact alone is sufficient to justify the efforts made to utilize waste of every description.

Formerly certain sweepings of threads were thrown on the waste heap, which the workmen knew not how to unravel; but for the disintegration of these the most ingenious and effective machines have been devised.

These machines take the rag or piece of silk at its entrance, restore it at its exit in the form of filaments, carefully classed in lengths and fineness, proper to be submitted to the machines for decomposing the *chiffon* or rag.

The inventors have not exhibited these machines, from fear of imitation by countries where inventions are not protected by patents. Prussia and Switzerland are in this condition, and they are precisely the countries which would derive the greatest advantage from their use.

DYEING AND SURCHARGE OF THREADS.

We have but little to say on the dyeing of silk, so brilliant in itself, and advanced to such an extraordinary degree of perfection.

No kind of material offers more splendor in this respect.

The invention of those colors derived from coal has principally contributed to or caused this revolution in the art of dyeing. The new materials have permitted dyers to obtain colors of unprecedented splendor, combining shades of marvelous variety with extreme delicacy. Looking through the exhibition, we might almost say, in the presence of the results obtained in this direction, there is now nothing impossible. Still, close by the side of products so admirable in respect to dyeing, we saw, on the contrary, much still left to be accomplished. We refer to the attempts made for some time to gild and silver threads of silk. Some specimens of silk of this kind exhibited denote processes still in a crude state, which do not yet supply any product capable of being used advantageously.

Another branch of dyeing is, on the contrary, in a very advanced state; sometimes too far advanced.

Reference is here made to the means used to *surcharge* silks, so as to make them gain, if one wished it, as much as one hundred per cent. upon their normal weight.

This process has an honest origin, and sometimes its applications are honest; but it is not unfrequently used for purposes of gross deception. For example, when the threads and tissues are sold by length or by surface, these surcharges have no other result than to give a certain appearance to the article, while the thickness of the tissue plays no other part here than that which frequently results from the stiffness of stuffs of this sort, without any detriment to the buyer. But, on the other hand, when the threads, and even the tissues, are sold by weight, it makes the purchaser pay the price of silk for a considerable quantity of foreign matter which, sometimes, has not a fortieth part of the value of silk.

Nevertheless the authors of these operations, whose main object is to give increased weight to silk, are tolerated and even rewarded at the exhibition, under the pretext that they thereby aid in meeting foreign competition.

These are specious pretexts which ought to be made known. As these efforts for facilitating the best employment of waste are worthy to be pointed out and recommended, so, on the contrary, these reprehensible practices are to be deplored and condemned.

WEAVING.

THE WEAVING OF STUFFS OF ONE COLOR, VELVETY, OR PILED FABRICS.

We observed at the exhibition some plain silks made in France, Switzerland and northern Germany, leaving nothing in this department to desire.

The result proves that if the automatic working of plain silk goods be not yet general, it results from special causes in the organization of the fabrics rather than from difficulties in the execution of the work, for the perfect specimens hereinbefore mentioned were exhibited with the special notice that the weaving was done by motive power.

We examined with care the looms by which this result has been attained. Looms of this kind were exhibited in the English, French and Swiss sections of the Exposition. The two latter nations have more especially applied themselves to the construction of looms intended for silk weaving, while the English looms, being adapted to more general use in the weaving of almost every kind of fabrics, are not so well fitted to the weaving of silk, which demands particular care and special adaptation.

The Swiss and French also make the *canettes* for the tram, the *ourdissoirs*, destined to dispose the *chaine*, and the arrangements for raising and advancing it on the loom.

They thus have an appearance peculiarly their own. Competent men quickly observe that certain alterations, which influence only the proportions and relations between the different means generally used in all looms of this kind, and, in this case, important modifications.

These changes are especially employed in utilizing the peculiar elasticity of silk, so as to obtain from it the regularity which the interlacing of threads in silk goods demands, and also to be better able to secure cleanliness, purity and brilliancy.

By the side of the machines and apparatus of which we have just spoken was exhibited a French machine, to polish automatically these same stuffs. This machine, alike ingenious and efficacious, possesses all the advantages of hand polishing, acting with only a little polish and in parts.

All these machines have great value and interest for American industry; and it is the same with the automatic looms for the manufacture of velvet stuffs, such as plush for hats, &c.

These automatic looms may be arranged in two classes. The one class works two pieces at one time; the other only one. Both have their special object and employment.

The oom which makes two pieces at the same time is furnished with three chains superposed, the one above the other, at suitable distances. The middle chain is intended to supply the thread which, by the *coupe*, or cutting, forms the velvet surface. The middle

chain, or *chaine de poil*, has a much greater length than that of the other two. It is proportional to the length of the piece multiplied by the height of the *duvet*, and by the number of *boucles* or loops necessary to each of them.

The interlacings in the weaving of these three *chaines* are such that they form two *toiles* or fabrics, between which is interlaced a certain height of the thread of the *chaine*. This height is exactly and automatically separated in two by the middle one, in order to supply the velvet surface to each piece, which, thus separated, is then rolled upon the roller as fast as the section is worked.

Various articles in silk, and especially the most beautiful plushes for hats, are executed in this manner.

This system is more particularly suited to plain articles wherein the *duvet*, without the intervention of the *baguettes* or small rings employed in hand weaving, necessitates a certain height, and can be employed to manufacture *faconnes*, or figured stuffs, and very smooth velvets.

The automatic work in smooth and fine velvets has yet only reached the extent of weaving one piece at a time. The operation is effected by the insertion of irons to determine the *boucles* or loops which remain closed in the work of velvet *frise*. The iron is withdrawn when a certain number of *boucles* or loops are fixed by interlacements.

If, on the contrary, the object is to make velvet *coupe*, it is effected by cutting at the top each of these loops or *boucles*.

Thus, to the ordinary functions of weaving machines, it is necessary in the weaving of velvets to add combinations, which place and withdraw *baguettes* to form the *frisure* in which these *baguettes* are placed, and act as a knife or plane to cut these same loops in order to produce cut velvet.

These problems have been solved in the most successful manner by the looms at the Exposition. It need hardly be suggested that a personal examination of the machines above mentioned would give a far clearer idea of their structure and operation than could the most elaborate description. The same may be said of the machines hereinafter noticed.

If from plain articles we pass to striped and plaid silks, in the execution of which Scotch industry has long excelled, we shall encounter some difficulty and embarrassment in choosing from among the numerous automatic looms now multiplied to a marvelous extent, permitting the frame to change spontaneously a greater or less number of trams of different colors. The numerous looms of this kind exhibited demonstrate the activity and necessity of research in this direction, and also the energy with which science and skill are employed on all those problems whose solution can lead to utility and economy.

It is not only in articles of an ordinary character that this tendency is observable. It is no less remarkable in silks of the richest devices, and especially in the most beautiful articles of Lyons, adapted as well for dresses as for furniture.

THE WEAVING OF FACONNES.

It is worthy of note that despite the increasing dearness of silk thread, these silks, so very rich in all the perfection of their manufacture, are not sensibly increased in price.

Never, perhaps, have the stuffs of Lyons displayed more taste than now. Never have they or those of Tours exhibited greater beauty and perfection.

Among the silks for toilette we remark, especially in the *faconnes* or figured goods, a fineness and neatness that seemed almost impossible till now, which denote a superiority to which French industry alone has yet arrived.

There are also combination *armures* and *moires* as the basis of tissues, demonstrating that there no longer exist difficulties in this direction.

It was sufficient to traverse the gallery of the French machines to be fully impressed with these views. Ingenuity has been tasked in a thousand different ways to simplify the elements of the Jacquard loom and render it capable of producing still more extensive results.

It secures economy in the use of the cards, necessitated by this manufacture, by diminishing the surface of holes, or *trous*, and of the folds which separate them, in such a manner as to make them contain more in a given surface.

Besides the cards entirely dispensed with and replaced by a simple sheet of paper, further on, there is an ingenious combination which permits the same card to serve twice successively, and to produce two different effects, and enables it also to economize at least 50 per cent. of cards.

There are savings of another kind in the automatic execution of stitching, due to the introduction of an additional organ into the frame to make *façonnes la battant brocheur*.

Blonde, an article in silk imitating lace, is also exhibited by both England and France. This article made automatically, and which for years has displayed the most elegant designs, now presents devices the most capricious and seducing. These results are attained by the combination of the net lace frame with the principle of the Jacquard frame, skillfully modified in its applications.

Until now, manufacturers were content to vary the designs and multiply the figures, and hence a single loom of this kind produced with considerable economy hundreds of *bandes* at once. But that was not sufficient. The industry of Calais (the centre of the *tulle* and *blonde* trade of France) had just created an article essentially different from ordinary lace and *blonde*. It was obtained by the interlacement of threads acting exclusively in the direction of the *chaine* in the *tissues a maille*, to which we have alluded.

A transversal thread of the tram made a part of the tissue, the physiognomy of which and the mode of interlacing being thus essentially modified. The modifications, proceeding from an additional cross-thread, could be carried upon the *reseaux* from the bottom, and those of the *faconnee* at the same time.

A new and vast field thus opens to the specialty of reticular tissues, already so rich in fancy articles. Perhaps, also, this kind of stuff will pass from silk to cotton, and to other substances, and ultimately give results analogous to those of a species of gauze, which is produced, if not with great difficulty, at least with great slowness, and at considerable cost.

The new article may probably serve as tissues for sifting flour and all kinds of plaster substances.

The mechanical means by which these results are attained, and many others, into the details of which we cannot now enter, combining with the use in a greater and constantly increasing extent of cheap silks, demonstrate a gratifying progress in this direction.

SILK RIBBONS.

We have only spoken briefly of ribbons from a technical point of view, because this industry was represented at the Exposition by but one loom, that for velvet, sent by M. Joyot, jr.

As to the products, they were exhibited for the most part collectively by the manufacturers of Saint Etienne, Basle, Prussia, Alsace, and other sections.

Saint Etienne contains 90,000 inhabitants, and with its suburbs gives employment to 21,622 persons, of which the greater part are women and girls. It has 15,000 looms. According to the Chamber of Commerce, the value of its productions for the year 1866 was 60,000,000 francs ($12,000,000), five-sixths of which was disposed of to the United States, England, and to the city of Paris.

The canton of Basle, with a population of 65,000 inhabitants, has about 6,000 looms for the manufacture of ribbons in the city of Basle alone. The manufacturers, many of whom are of the first order, employ from 300 to 400 hands each, while some few employ a much larger number. The United States takes the largest quantity of these goods. Then comes England, whose trade in continental silks has greatly augmented since the last treaty of commerce with France. It was at Guebwiller, in Alsace, that steam was firs

employed in the manufacture of ribbons. One may see there a mode ribbon factory which employs 600 persons, and c ntains 200 looms, driven by a steam engine of 30-horse power.

DEPENDENCE OF SILK MANUFACTURERS UPON THE EAST.

In view of the vast capital invested in silk industry, and especially in silk manufactures, by leading European nations, and the great number of their people employed in its prosecution, we may, in the presence of the crisis which has overtaken their silk husbandmen on account of the prevailing malady, pertinently ask what would have been the fate of the industry and the condition of its employees had not the extreme east been able to supply them with raw material in quantities sufficient to meet the exigency? And what advantages have not the nations of Asia derived from being thus brought into closer relations with the more elevated and advanced nations of western Europe? Notwithstanding the relatively low price at which they can supply their silks, they could not, a quarter of a century since, have anticipated so high a price as they are now receiving. Nor is this the only advantage resulting to these oriental nations from this species of trafic with the silk manufacturers of Europe. It will teach them how to bring their products to greater perfection at home, and will stimulate them to prepare them with such care, and bestow upon them such an amount of skilled labor, as to draw from them all the value and profit that comports with the excellence of their nature.

RESUME AND CONCLUSION.

The manufacture of silk as already analyzed, and as it exists in countries the most advanced in the art, embraces seven special branches of industry, viz:

1. The rearing of the silk worms.
2. The filature or reeling of the silk from the cocoons.
3. The throwing or spinning of the silk thread.
4. The dyeing of the silk.
5. The preparation of the silk threads for the looms.
6. The weaving of silk goods.
7. The spinning of waste silk.

These specialties, although consequent and dependent each upon the others like links in a chain, can nevertheless be practiced separately, as is the case now in some of the countries.

We have demonstrated that some of these employments present more difficulties than others to countries which, like the United States, have not yet had sufficient experience therein. America can, however, hope henceforth to excel in these industries whenever she resolutely wills it, and devotes to them that energy and skill which have placed her in the first rank among nations for certain of her inventions and manufactures. Let her not be disheartened at her efforts in this branch of industry already most praiseworthy, and especially so in New Jersey, Connecticut, New York, Massachusetts, Pennsylvania and California; but let her press on and bring to this new enterprise that genius of investigation and energy in execution which have attracted to her so much attention, and attained for her such honorable distinction in the Universal Exhibition of 1867.

Concerning the seven industrial branches employed in the transformations of silk, four can from this period develop themselves without any difficulty, and soon take, in America, the high position already attained by cotton industry, namely:

1. The throwing of the silk, consisting in the employment of apparatus more simple and also less difficult to direct than the greater part of the machines in the factories of the United States. As to the raw material, it is as easy for the United States as for England to immediately supply herself with raw silk in China, Japan, and even in the Levant and

India. It is by no means improbable that at no distant day New York will become as important a depot of Asiatic silks as London now is. This may be accomplished via San Francisco, through the medium of the Pacific railway. The raw material having thus reached New York, will be distributed not only among our own manufacturers, but portions doubtless will be exported to foreign countries. Let the New World take England as an example in silk industry. In less than half a century the silk manufacture of Great Britain (which does not produce a single pound of silk upon her own soil) has arrived at such a degree of development as to give employment to a large amount of capital and to about 110,000 looms, and direct occupation to some 200,000 persons, not including those engaged in the ribbon and silk hosiery manufacture.

2. The dyeing of silk, already an established branch of American industry, needs only the encouragement to be derived from the establishment of co-operative branches to compete successfully with European skill.

The preparatory processes of ungumming, cleansing and scouring are very simple operations, and can be entered upon without delay.

3. As to the regeneration and spinning of silky waste of all kinds, the United States find themselves in as good a position as most other countries to undertake a work of this sort, inasmuch as they possess equal facilities for producing the waste and raw silk.

Who can doubt, therefore, that this will soon become an important branch of American industry?

In the manufacture of *passementerie* or trimmings, made to a great extent of silk waste, there are employed in Paris alone 8,500 persons, producing annually products to the value of about $8,000,000.

This branch of industry throughout France occupies more than 30,000 hands, and the entire annual production exceeds $20,000,000. It is one of the occupations which, like manufacture of ribbons and laces, employs the largest number of women and children, who earn from 20 to 60 cents per day.

The wages depend both upon the skill of the laborer and the nature of the work. Men earn from 60 cents to $1 50 per day.

St. Etienne is noted for its fashionable dress trimmings; St. Chamond for its excellent cords, braids and stay-laces, employing about 2,000 frames, or *metiers a la poupee*, in weaving stay-laces alone.

Most of these articles are extensively copied by foreign manufacturers from samples obtained in Paris. A system has been inaugurated there for promptly supplying samples of all novelties in silk fabrics by the payment of a yearly subscription.

4. With regard to the automatic weaving of plain stuffs, the United States already compete successfully with the more experienced nations of Europe. It is gratifying to know that the looms exhibited by American constructors have been highly appreciated for their ingenious contrivances and remarkable improvements.*

There remain, then, three specialties, to excel in which, time will be necessary to obtain the experience requisite for complete success. This our countrymen will indubitably acquire in due season, if they will only bring to the task their usual sagacity and proverbial perseverance.

These specialties are:

1. The rearing of silk-worms.
2. The reeling of the cocoons into raw silk.
3. The weaving of figured goods more or less rich.

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*The looms exhibited by Mr. M. Opper, of New York, Mr. George Crompton, of Worcester, Mass., and the knitting machine of Mr. J. W. Lamb, of Rochester, attracted specia attention, and a silver medal was awarded for each.

We will speak of them in their order:

First. As to the rearing of the silk worm. The most important element in this matter seems to be solved, namely—the culture of the mulberry. The various previous trials in the United States already mentioned have proved that large sections of the country are admirably suited to the growth of this tree, so indispensable to the rearing of the worm. And from what has already been shown it may be inferred that if the breeding of silk-worms has not been hitherto entirely successful, it is probable because that, at the periods of these early attempts, the agricultural population was not sufficiently instructed in details, and therefore failed in some essential particulars, or lacked somewhat of that patience which the French and Italian cultivators bring to this particular pursuit. But with an increase of experience, daily augmented by recruits to our population from the skilled labor of Europe and China, with individualities and talents the most diverse and elastic, with abundance of capital seeking investment, and above all, with our fertile and remunerative soils, and the superior climatic conditions of large sections of our country, it is not possible that new trials, judiciously conducted, should fail of success.*

Second. The reeling or filature of the cocoons into raw silk, which comes next in order, constitutes, perhaps, one of the processes the most difficult to teach, and especially in localities wanting in experience in this particular branch of silk industry.

The superiority of the French and Italian silks over Asiatic silks is generally owing to the perfection of reeling. The success of this process depends, in a large measure, upon the care and watchfulness of the attendant, especially so far as the perfection of the product is concerned.

The rapid analysis above made of this kind of labor may assist us to understand the difficulty that besets this branch of the work, but we shall render it still more palpable by saying that the most experienced workwoman can hardly produce more than 300 grams (or 12 ounces) in good silk of the ordinary qualities obtained from five or six cocoons per thread, of which the quality or fineness is from 10 to 12 *denier*, being 24,000 yards per ounce.

Nevertheless, the country which produces the most skilful and careful spinners of wool and cotton manufactures will not despair of arriving eventually at the successful production of the many kinds of silk goods so clearly within its province.

Third. Though we feel assured that the industry of the United States will soon largely develop itself in the weaving of plain, striped, and plaid silks, of velvets, of plain ribbons and other silk fabrics, simple in their character, yet we cannot conceal the fact that long and patient study is necessary to produce articles of sufficient novelty and artistic skill to compete with European industry, and more particularly with that of Lyons, which shines with a brilliancy peculiarly its own.

The great experience, cultivated taste and extensive knowledge of the French have made this specialty with them a veritable art.

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*As a proof how the introduction of this industry into a locality will enhance the prosperity of the whole people, an interesting fact may be cited from a recent French publication. An officer in the French army, having seen during an Italian campaign to what degree the cultivation of the mulberry tree and its attendant silk husbandry were enriching the population, resolved to introduce it into the little vale in the commune of Valleraugue, where he owned an estate. Soon after the introduction there was obtained there only some 2,000 kilograms of very poor unsaleable cocoons. But, after a few years, 200,000 kilograms, of an excellent quality, were produced annually, valued at 1,000,000 of francs (say $200,000), which sum was mostly diffused among the rural laboring population of a village of 4,000 inhabitants. The work was carried on in the following manner; the well-to-do proprietors gave out the silk-worm eggs to the laborers, upon the condition that a quintal (100 pounds) of cocoons be returned for every ounce of eggs; also, giving them a sufficient quantity of mulberry leaves to feed the worms hatched from the eggs, and a certain quantity more. The cocoons produced from the surplus constituted the profit of the silk-worm cultivators.

The employment of Jacquard looms forms the basis of success in textile fabrics. But although this loom is universally in use, the effects it can produce have been nowhere pushed to so great an extent as in France, and particularly in Lyons.

The same may be said of Calais in its application of the Jacquard to *blondes*, or figured silk laces.

The Exposition proves, by products of this kind, that henceforth to automatic labor almost nothing is impossible.

The magnificent specimens of lace there displayed, which imitate and well nigh rival the most exquisite and elaborate efforts obtained by the slow and tedious process of hand labor, are now the results of the motive power of steam, while the functions of the workmen are limited to a superintendence which becomes almost a sinecure on account of the admirable precision and perfect execution of these machines.

It is thus that fabrics, alike beautiful and useful, once ranked among articles of luxury, and accessible only to the wealthy, are each day rendered more available to the masses, contributing both to the prosperity of the producer and the gratification of the consumer. So far from despairing of ultimate success in rivalling the most elaborate and brilliant productions of Europe in this department of industry, the people of the United States may take courage from the fact that already a most successful beginning has been made in silk weaving.

Paterson, New Jersey, and Hartford, Manchester, and Mansfield, Conn., are already noted for their extensive silk manufactures.

For many years past all the sewing silk and twist used in the United States have been of home manufacture.* The same is, in a measure, true of pongee handkerchiefs. Rapid progress is being made in the weaving of ribbons, braids, trimmings, fringes and various kinds of dress goods.

More especially may Americans be encouraged to prosecute this industry in view of the exemption of our continent from the malady among silk-worms now prevailing in Europe.

The devastation carried by the epidemic can hardly be overestimated. The steady advance of the malady threatens to embrace within its widening circles the silk-growing countries of the east, and thus cut off one of the main sources whence European manufacturers draw their supplies of raw material.

The calamity has thrown a pall over silk industry in all its branches. In the course of a speech on agriculture, delivered last year in the Corps Legislatif, M. Thiers said that the annual loss to silk culture in France from this cause alone, for several years, has been upwards of 100,000,000 of francs, (*$20,000,000.)

Andrew Murray, Esq., in an elaborate report on "Products of Useful Insects," at the Paris Exhibition, printed in the *Illustrated London News* of the 6th of July last, in speaking of the supply of *graines* (eggs) in the future, says:

"While things jog on as before from year to year, the cultivator will be slow to believe it possible that a time may come when no fresh *graines* (or eggs) are to be had. But the supply hangs upon a thread; when every silk country in the world shall have become infected, then the supply must cease. And we are not far from that stage. Japan and Australia are the only countries now free. When they go, the silk trade will collapse, and silk be blotted from the list of textile fabrics. That indeed would be a calamity which would come home to ourselves. Our silk spinners and silk weavers, our ribbon makers, our silk mercers and the thousands who depend on these trades for subsistence, would have their occupation gone, and ruin and starvation would await a large portion of our popu-

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*The Williams Silk Manufacturing Company, of New York, exhibited excellent "silk twist," for sewing machines, for which honorable mention was made, equivalent to a diploma.

lation. Surely, to avert such a result, not only in this country (Great Britain), but also over a large part of the continent, deserves that every suggestion which promises escape should be carefully considered; and surely, if by any measure, however stringent, one country could be cleansed from the infection before its spread ends in a complete extinction of the race, and so the threatened ruin averted, it ought to be adopted."

Unlike almost all epidemics, this does not disappear from a locality after one or two visitations, but once established, it remains, while its virulence increases rather than diminishes. This extraordinary trait is attributed to the fact that the silk-worm, by the law of its existence, is an annual, and therefore has no acclimated subjects, but presents to the epidemic a yearly supply of fresh victims. And in view of the geographical position of the United States, it may be noted that M. de Quatrefages, an eminent French writer, who has carefully studied this subject, expresses the opinion that, contrary to the general course of epidemics, this travels eastward rather than westward.

This mysterious malady, which seems destined to destroy silk husbandry in the whole eastern hemisphere, has not appeared in the western. In view of its easterly course, and with the Pacific ocean between it and the American continent, and with our superior climatic conditions, it is hoped and believed that with precaution and care it will never reach our shores.

The soils, and especially the climate of those States of the Union where the cotton plant and the sugar cane have been wont to flourish, are peculiarly adapted to the raising of the mulberry and the raising of silk-worms.

From obvious causes some of the long existing industries of portions of these States will hereafter be necessarily modified to a noticeable extent. The culture of cotton and the production of sugar will not so exclusively engross the attention of their population as formerly. A portion of their capital and labor will doubtless seek new fields for the exercise of their energies.

Are not these facts an exhortation, an admonition even, to the people of the United States, to promptly avail themselves of their providential advantages, and by devoting a liberal share of their resources to the production and manufacture of silk, save this important and beautiful industry from ruin, while at the same time they advance the prosperity of their own country and confer incalculable blessings upon the world?

In conclusion, the undersigned cannot refrain from expressing here publicly his thanks to Messieurs Arles-Dufour and Duseigneur, of Lyons, and M. Alcan, of Paris, as well as to the many prominent manufacturers and merchants in the different centres of industry in Europe whom he has visited, for their kindness in assisting to make the numerous researches which became necessary in the examination of this important and diversified subject.

The works of M. Louis Reybaud, M. Pasteur, M. de Quatrefages, the archives of the chambers of commerce of the various cities of France, Switzerland and Germany, and especially that of Lyons, have been valuable sources of information.

The report now submitted has swelled far beyond the limits anticipated at its commencement; but, silk industry in all its branches, now grown to such importance throughout Europe, the conspicuous place it occupied in the Exposition; its comparative novelty in the United States, and the prospect that ere long it will be firmly established and diligently prosecuted in many sections of our country, seemed to call for a careful and thorough investigation, and a full and detailed statement of facts and conclusions.

ART. X.—AGRICULTURAL DEPARTMENT.

FERTILIZERS AND DEEP PLOWING.

We join these two subjects to consider them together, because they have more relation to each other than may be supposed by those who have not experimented with both.

Let us consider the effect of deep plowing with the use of the fertilizers, and without them. It is admitted by every good authority on the subject that the rain water is fertilizing, principally on account of the ammonia which it conveys to the soil. The average quantity of rain-fall in the year is about 46 inches; the heaviest shower of rain will rarely exceeed 3 inches, and is generally much less. If the soil be plowed but 3 or 4 inches in depth, it is evid ent that the 3 inches of rain of the heavy shower cannot be absorbed by it, and that the excess will run off, after the stirred soil is saturated. The ammonia in that portion which runs off is lost, besides carrying off some of the valuable soluble substan ces in the soil; whereas, if the soil has been broken up to the depth of 12 inches, every thing would have been retained. For the same reason, if soluble fertilizers are used, there is danger of a great portion being washed away if the ground has been broken up shallow; but if, on the contrary, it has been broken up deep, every portion will be retained. Let there not be any apprehension that the roots of plants will not reach the manure; for experiment has shown that the roots will penetrate as far as the ground is stirred.

The commercial fertilizers, so called, are stimulating; they act as solvents of the soil and greatly accelerate the growth of plants. In this condition the effects of a drought are much more damaging. To guard against this, when fertilizers are used, the ground should be stirred very deep, so that the roots may find moisture by running deeper below the surface. The want of deep plowing with the use of fertilizers has often been the cause of disappointment to those who have experimented with them. The roots of plants have no faculty of locomotion but their extension in length. If the ground be cultivated shallow, we may well understand the roots exhaust after a certain time all the assimilable substances within their reach. If they then reach the hard pan beneath, they cease in a measure to give nourishment to the plant. It is then evident that the greater extent they are capable of reaching the greater will be the quantity of matter accessible to them as food for plants. These circumstances become the more important when soluble manures are used, such as guanos and their preparations.

These soluble manures have been looked upon with unfounded prejudice. It is no uncommon to hear a farmer make the remark that they all disappear the first year, and leave nothing for the next; whereas, other manures will last several years. It is simply a question of calculation by which will be determined which is most profitable, to reap the interest of the capital or the benefit of the outlay, in one year or several. It is perfectly within the capacity of the farmer to use the quantity required for one year.

It would be also a mistake to suppose that because they are soluable they are easily washed away by heavy rains. The fertilizers, when put in the ground, undergo certain chemical transformations; they have the faculty of combining with certain substances in the soil, make new compounds that are either not entirely soluble in water, or have such

an affinity for the soil that they are retained until absorbed by the peculiar action of the roots of plants. The nature of the action of the soil in contact with fertilizers can be understood by the effects of dried soil, acting as a deodorizer and disinfectant for all animal and putrid substances, so much so that it is now used in that manner in hospitals and cesspools.

The advantage of deep plowing in connection with the use of fertilizers is evident.

The advantages of deep plowing otherwise are so well known that it would be repetition to dwell upon it.

These remarks are suggested by the peculiar circumstances attendant upon the farming interest of the country. The price of labor is much higher than it has been heretofore, more difficult to obtain and to control, and the prices of agricultural products largely increased. It is then a question of calculation, of dollars and cents, to make labor pay. If the product of an acre can be doubled by an expenditure of $12 to $15, it is evidently an economy of labor. The acre in sugar cane that would produce 1000 lbs. of sugar only, is worth now in the market (with every prospect of a further increase in price) about $150. The acre of good land generally produces the double or more, which would be obtained by the addition of the fertilizers. The same rate of increase in production holds for all other crops. The very poorest crop for profit, that of corn, would still pay by doubling the product.

We would urge again the importance of making some accurate experiments with the fertilizers on sugar cane, which has never yet been done in a proper manner; not so much on account of the knowledge to be derived from those experiments, as a means of conviction of the advantage in their use. For nearly all other products the experiments have all been thoroughly and successfully made, and nothing left in doubt for new comers, who have nothing more to do than to inform themselves. But for the sugar cane, although we might conclude with strong probability by analogy, yet it would be more safe to test the matter by actual experiment before going largely into it.

In order to make these experiments with satisfaction, the following rules should be observed:

1. Deep plowing, as an essential condition, to a depth of at least 10 inches, and the proper pulverization of the soil.

2. Bedding off the ground, for crops planted in rows, by throwing off three furrows on each side with a mold-board plough, and then follow in the open furrow with a scooter or subsoil plough, thus penetrating easily to the depth of 12 to 14 inches in the place where the row is to be.

3. Scatter into this furrow one-half of the quantity of fertilizers intended to be used on the acre; then ridging up upon it with a turn plow, by throwing one furrow from each side. This last operation to be made several weeks before planting, to give time to the fertilizers to get incorporated with the soil.

4. Use the other half of the quantity of fertilizer when the growth is several inches high,—say some time in the month of May,—bearing off with one furrow close to the row, scattering the fertilizer therein, and covering it up immediately with a furrow run the other way.

5. A field should be treated in this way alongside of another which would be cultivated in the ordinary way, without fertilizers, making the conditions of cultivation otherwise as much alike as possible.

6. Gather the crop separately from each piece and compare carefully, for quantity and quality.

7. Those making the experiments are earnestly requested to report in writing to the REVIEW, with all particulars. These reports will be published for the benefit of all, and thus a number of facts will be obtained, and reliable data on which to base proper conclusions.

The reason for using the fertilizers at two different times is, that if the fertilizer is entirely soluble, such as guano, preparations of it, and the preparation extensively known as David Dickson's mixture, it is quickly absorbed by the plant and entirely exhausted before the plants have attained their full growth; and by using the other half later, it is more uniformly utilized and to better advantage. The effect of the first application is to give the plants an early start and a profusion of leaves, and of the second application to form seed or fruit.

The kinds of fertilizers might be varied perhaps to advantage; as using first, guano which contains ammonia, to develop leaves; and later, the bone phosphates to produce seed.

We insert below a very interesting extract on the subject from the *Southern Cultivator:*

"Under the head 'What should guide us in the manufacture of fertilizers,' in the last *Cultivator*, you very truly say that the atmosphere may perhaps supply ammonia and nitric acid enough for half a crop. J. B. Lawes, in his experiments, made several consecutive trials to prove how much of a crop might be grown on a soil thoroughly exhausted of the compounds of nitrogen, but well supplid with phosphoric acid, potash, lime, etc., and the result was, that with the best of tillage he got 15 bushels of wheat to the acre; but when 200 lbs. of the sulphate of amonia was applied to the same soil, the crop exceeded thirty bushels.

"Prof. Horsford, of Cambridge, avers that the acid, phosphate of lime, is a more efficient manure than the finest bone dust, not that it contains more super-phosphate, but from the action of its acid on the insoluble matter in the soil. He says that the acid of the super-phosphate seizes the potassa in the feldspar of the soil and disengages it from the silica and alumina, making the potassa soluble and available as plant food.

"I suppose it might also be said that the acid made the insoluble silex of the soil soluble, but I take it that ammonia and nitric acid, and also the carbonic acid of decaying vegetable matter, also tend to make other matters in the soil soluble and available to plants.

"The Professor tells us that, when the barren, sandy plains of Seekonk, in Rhode Island, were made productive by the application of the acid phosphate of lime, sulphate of lime, and sulphate of ammonia, it was a marvel to the chemists how the plants obtained their potash, and to some extent their magnesia, from the barren sand. To ascertain this by practical experiment, feldspar was pulverized and treated with the acid phosphate of lime, which immediately disengaged the potassa from the silica and alumina of the feldspar, yielding a soluable phosphate of potassa. A similar experiment with steatite (soap stone) showed the same action on the magnesian mineral."

HOME MADE SUPER PHOSPHATE.

Get all the bones you can find; put into a wide wooden trough, 500 to 1,000 pounds at a time; take pure sulphuric acid (60 degrees quality) at the rate of two carboys to a ton of bones. Mix half and half with warm water, and apply directly over the bones

Sprinkle over the top with dirt; allow them to remain a day or two, and, on uncovering, the bones will fall to pieces at the slightest touch. Spread out on the floor to dry, and you have a super-phosphate better than can be bought.—*Horticulturist.*

DIGNITY OF THE AGRICULTURIST.

No man is so high as to be independent of the success of this great interest; no man is so low as not to be affected by its prosperity or decline. The cultivation of the earth is the most important labor of man. Man may be civilized in some degree, without great progress in manufactures, and with little commerce with his distant neighbors, but without cultivation of the earth he is, in all countries, a savage. Until he gives up the chase and fixes himself to some place and seeks a living from the earth, he is a roaming barbarian. When tillage begins, other arts follow. The farmers, therefore, are the founders of human civilization.—DANIEL WEBSTER.

STEAM PLOWING.

The use of the steam plow is becoming a matter of great interest in our agriculture It will be a surprise to many to learn how large a number of these plows are in operation in England. We have seen the assertion made lately that there are as many as two thousand in that country. The *Mark Lane Express*, speaking of the trials of steam cultivators, at Leicester show of the Royal Agricuitural Society of England, says: "No one could examine the work done without being convinced that the soil was turned up and left to lie under the best possible circumstances calculated to allow the atmospheric influence, the best of all cultivators, to act upon the whole mass, and to leave it after an autumn and winter in that condition to which very little working by other implements would be needed."

In the monthly report of the Department of Agriculture for May and June, we find the following account of a trial made lately in New Jersey:

"An interesting trial of one of the Fowler double-acting steam plows has just occured in Burlington county, New Jersey, upon a tract of 32,000 acres owned by Colonel William C. Patterson, of Philadelphia. Several hundred acres were planted in beets in 1868, with a result so successful that the proprietor determined to initiate and undertake the manufacture of beet sugar upon a large scale, and is making arrangements of a magnitude commensurate with the extent and importance of the undertaking.

"The Commissioner of Agriculture was present during several days' plowing, and returned more than ever convinced of the practicability and necessity of introducing steam generally in the culture of all lands in the country adapted to this improved mode of culture.

"The gang of plows consisted of twelve, six operating at a time, driven by two 14-horse power engines, one at each end of a series 60 rods furrows; the breadth cultivated at one movement was 78 inches, the depth 8 inches, and the furrows were laid with faultless regularity, at a rate of speed which would insure the perfect plowing of at least 18 acres per day, and under very favorable circumstances 25 acres.

The machine was guided easily by a man, and reversed at the end of the furrow without a moment's loss of time. The surface was rough, though the soil was a sandy loam, easy of cultivation.

"Two other steam plows of the same manufacture are already in use in this country, one in Louisiana and one in the West. The successful use of these machines must stimulate the introduction of others, or, better still, the more perfect adaption by American inventors of steam cultivation machinery to the wants of American agriculture. It should be remembered that the principle upon which this machine is built was first applied in an American invention of more than 30 years ago."—*American Farmer*, Baltimore.

The above extract is suggestive of what could be accomplished in this country by steam plowing, and leads one to the reflection why it has not been more extensively introduced. There are but five of these machines now in use in the United States, four of which are in the State of Louisiana and one in the State of New Jersey, whilst there are in actual use in England upwards of 2,000! and many more in France, Belgium and Egypt. Why is it that the United States is so far behind the age in the introduction of this improvement in cultivation? The United States is essentially an agricultural country. It is, or promises to be, the granary of the world, as well as the source of many other articles of prime necessity. What we do want is cheap freights, easy and open communication with the sea, and economy in the labor of production. This last requisite is now offered by the use of the steam plow. The Americans have surpassed the whole world in the production of perfect agricultural implements and labor-saving machines. They have successfully been introduced in foreign countries. Is it that the pride of Americans in their superior skill has prevented them from having recourse to a foreign invention? True it is that some of the American inventions have failed to answer the purposes for which they were intended. They were all constructed upon the plan of traveling over the field, instead of using a stationary engine on the side of the field, as the English. It was not, perhaps, that feature that caused them failure. They were too heavy and cumbersome, and too costly, and this has prevented their practical use, although the machines did perform. If by some modifications these machines can be made practical, this feature of traveling over the field does, on the contrary, offer many advantages, which planters ought to be prompt to appreciate. On small grain farms these machines would perform nearly all the labor; for crops planted in rows, the machine could cultivate.

We can see no difference between the agriculture in this country and England that would not make the machines as useful here as there. Can the imagination conceive what would be the effect on our production if, as in England, there were two thousand of these machines in operation in the South and West? We would not hear so much of the unreliability of labor, and would not incur the risk of being overrun by the Chinaman.

DEEP CULTURE IN RELATION TO THE RETENTION OF MOISTURE IN ARABLE LANDS.

Deep digging, trenching and subsoil plowing, says the *Edinburg* (Scotland) *Farmer*, are the means for preserving the moisture in the soil during heat and drought. There are not wanting many evidences that the several acts of husbandry stated under this head are advantageous on every descaiption of land, even the most water-logged fields. But draining is a *sine qua non* in such fields, an operation that has been descriptively defined by Major McInvoy as "underground irrigation." "I consider," says he, "the most perfect system to be that which allows air and water to pass freely through the soil with their dissolving and fertilizing properties. Previous to draining and deep stirring, chemical action is very much confined to one stratum of soil—namely, where the air is neither

excluded or free, and where it is neither dry nor wet (speaking in common-place words). Subsequently the laws of composition and decomposition have full play, and their effects are diffused throughout the whole mass of soil. In an essay published several years since (for which the Marquis of Tweeddale offered a prize), it was said "that in every instance drainage gave a decided advantage in the increase of temperature, except only in summer, when a heavy fall of rain was found to lower the temperature of drained land more than undrained," which is evidently an advantage to a hot, parched soil.

The writer subsoiled nearly 100 acres of a light, thin, incoherent soil, consisting of a small portion of black earth, with gravel and sand resting on a gravelly, open subsoil. The subsoil plow, which was drawn by two horses in the track of the common plow, stirred the ground to a depth of twelve or fourteen inches. The weak point of the land so treated was its dryness, for even moderate heat and drought scorched whatever crops were grown; but we found the process beneficial, the crops more abundant and less liable to suffer from an arid atmosphere. The rain-water did not pass so rapidly away, and we ascribe this to the subsoil plowing shutting up the grooves and channels through which the water has descended for untold ages.

For this explanation we have been several times taken to task by intelligent agriculturists, who affirmed that subsoiling opened the interstitial places for the more rapid descent of water. Such, we believe, is the result of the operation in retentive bottoms.

The pulverizing of the soil also contributes to the retention of moisture. We were in this point a follower of Jethro Tull, and it was the perusal of his writings that set us to work. He pronounced the opinion that pulverization was the one great idea of successful farming. When large cavities abound in land, plants suffer more in dry weather than with minute pores. This proposition seems to be self-evident, but it has often been disputed, as contravening a law of capillary action, that the ascent of the water is in the inverse proportion of the diameter of the tube. Now, it cannot be denied that a fine division of the soil is analagous to small capillary tubes; but one fact is fairly overlooked in this reasoning, namely, that the fine, small particles of soil compacted together, exclude largely the air atoms, and thus prevent the full evaporative powers that would otherwise rule and operate. It is said that, in digging a hole in the soil in dry weather, pounding down the excavated earth, and afterwards returning it to the hole, more moisture is absorbed and retained than in the surrounding ground. This process we have brought to the proof, and found its truth amply verified in soils holding something less than their normal quantity of water, but in cases where moisture was redundant it was otherwise.

In the prevailing plan of draining soft flats forty or fifty years ago, we have undoubted evidence of the powerful action of evaporation. The shallow stone drains of eighteen inches proved an entire failure, so far as the removal of the surplus water was concerned. The great law of gravitation being counteracted by capillarity, the soft flats remained nearly as moist as ever.—*Dixie Farmer.*

THE RAMIE IN CHINA.

In China the seed is gathered very carefully before the approach of frost, and, when sufficiently dry, is placed in a jar or basket mixed with sand or dry earth, and the vessel covered with straw, as a protection against the frost. At the time of planting they are tested by immersion in water, the imperfect ones floating at the top.

The proceedings of the agri-horticultural society of India give an idea of the mode of culture and means of preparing the fibre. A loose, dry soil is selected, near a stream. The ground is well broken and manured, and laid out in beds eight yards long and one wide, which are carefully raked and watered one day, and the same process repeated the next day, previous to sewing. The seeds are then mixed with a little dry earth and sown broadcast, and afterwards the beds are swept lightly with a broom, covering the seeds and smoothing the surface at the same time. Matting is suspended on a temporary frame-work over the beds before the plants emerge from the soil, for protection until they are two inches high, and this covering is watered daily, and removed at night. When three inches high, the plants are transplanted in rows four or five inches apart; watering is continued three or four times daily for the first ten days, when an occasional wetting suffices. At the approach of cold weather, the field is covered with a heavy coating of manure for winter protection. In March the manure is removed and watering in dry weather resumed. In the third or fourth year, as it is stated, the stems are ready for cutting, and sometimes in the second year. It grows from roots, cut in pieces, and planted eighteen inches apart; they are ready for cutting the second year, and after a plantation is established, three crops per year are secured. The stems are cut an inch from the surface, the first cutting occurring in June, and the last in September or October, the stems being six or eight feet high. After cutting, the plants are covered with manure and watered.

The preparation of the fibre commences with the stripping of the leaves by women and children; then the stems are soaked in water and afterwards broken in the middle, thus loosening the fibrous portion, when the finger nails are inserted between bark and stem and passed from top to bottom, separating one-half the fibre. The remaining fibre, after further soaking, is taken off with a rudely made knife, the blade of which is about two inches long. This rude implement is held in the left hand; its edge, which is dull, is raised a line above the index finger; strips of hemp (or fibre) are then drawn over the blade from within outwards, and, being pressed upon by the thumb, the fibrous portion of one surface and mucilaginous portion of the other are thus taken off. The hemp rolls up like a boiled tendon. After being wiped dry, it is exposed to the sun for a day and then assorted, the whitest being selected for fine cloth.

It is then bleached by boiling and drying in the sun, when the tedious process of separating the individual fibres with the finger-nails is dexterously accomplished by women or children, leaving the material fine. Softened afterwards, a further bleaching is secured by soaking in water with a litttle lime, or the ashes of the mulberry leaves. During the bleaching process the fibre must be dry, as moisture will give it a dark color.

The China grass cloth has long been known to commerce, and the fibre was many years since brought to Europe, where it attracted the attention of manufacturers for its fineness, strength and beauty. It was found to be stronger than hemp, with the lustre of silk. At the British International Exposition of 1862, several specimens from India, Assam, and Malacca were exhibited. The report of that exhibition referred to these samples as attracting more attention than any other products of India, and stated that late experiments had shown that the fibre was susceptible of manufacture in a great variety of useful and valuable fabrics.

At the same exhibition samples were shown, bearing the name of *Bochmeria nivea*, a fibre believed to be identical with the *Bienacissima* of the same commercial value, although represented as botanically a different species. The plant flourishes at Darjeeling and other places in the North of India.

The Neilgherry nettle, *Urtica heterophylla*, abounding on the hills of that name in India, possesses a fibre used for similar purposes, sold at the same price, and is sometimes included with China grass fibres. It has been called "vegetable wool," is abundant in a wild state, and it is assumed that its cultivation would be profitable. The bark of the young wood steeped in water twenty-four hours renders easy the separation of the fibre. The nettle is one of the most formidable of the stinging tribe—a fact that might militate against its utilization.

The Technologist says that "the fibre is brilliant and strong, easily separated, regular in fineness, from 6 to 28 inches in length, of good natural whiteness, similar in fineness to the coarsest mohair, much twisted, generally flattened at the root end." This last peculiarity is a defect, otherwise it is a fibre perfectly adapted for spinning with coarse combing wools. It seems to be especially applicable for fabrics where bright stiffness is the quality desired. It dyes in a similar manner to China grass, but does not possess equal brilliance, strength or whiteness. If it were forced on the market, it would immediately take a position as a combing fibre, probably second only to China grass. It is reported to be obtainable in abundance, but the plant is a formidable one to manipulate.

ART XI.—COMMERCIAL DEPARTMENT.

THE COTTON CROP OF THE UNITED STATES FOR 1868-9.

We have received the report of the Statistical Committee of the National Association of Cotton Manufacturers and Planters. This report has been prepared with great care. Every effort was made to ascertain the truth, and both by reference to the various cotton mills of the country, as well as other sources, to arrive at a true statement of the actual cotton crop. The facts are all before the Committee, and the statement published by them vindicates the correctness of the annual statement of the cotton crop of the United States for the year ending August 31st, 1869, as prepared by the *Courier*, and as published at that time. We had taken every precaution and care for an accurate and reliable statement of the crop from actual facts and statistics.

It is gratifying to know that, now when the facts are ascertained, the annual statement of the *Courier* is the nearest estimate of the cotton crop presented or published by any journal at that period. Our estimate of the cotton crop was 2,358,369 bales. The *Shipping and Commercial List*, of New York, however, made it 2,260,577 bales. We were satisfied at the time that this statement was far below the total crop of the United States, and that our estimates were much nearer the actual fact. We then showed the error of the *Shipping and Commercial List*, in excluding from its general estimate of the crop the Southern consumption.

As the report well states, "The wool consumed in the United States is not excluded from any annual statement of the clip of wool in the United States. The cotton goods consumed in Great Britain are not excluded from the Commercial or Board of Trade statement of British manufactures. There is no reason why the Southern consumption of cotton should be excluded from the cotton crop of the United States."

As we said in our editorial of the 16th of September, "In the *Courier*'s statement, which appeared on Tuesday, we included the amount consumed in the Southern States in our summing up of the total crop, as we have done in years past, and as we think should be done. The cotton consumed by Southern manufactories is as much an article of commerce as is the cotton consumed in Manchester or Lowell."

It will be perceived that the *Shipping and Commercial List* made the crop less than that of the *Courier*, 100,890 bales.

The facts are now ascertained, and the estimate of the *Courier* is proved to be substantially correct. The committee in their report say: "For many years the *Shipping and Commercial List*, of New York, was justly the standard authority for annual statements of the cotton crops of the United States. Your committee feel compelled to show that the *Shipping List* is no longer to be regarded as authority, and to expose the errors which have rendered its cotton statistics worse than useless since the close of the war. They do it reluctantly."

And the mode in which this error in the statistics occurred is thus stated. "The question at issue is not merely whether the Southern consumption of cotton the past year was 80,000 bales, or 173,000 bales, though that is an important one, but the question is whether the public is not misled by receiving as standard authority a compilation radically defective. In the form used by the *Shipping List*, the subtraction of 173,203 bales from the production of the country, instead of 80,000 or 85,000 bales, left the crop smaller by the excess subtracted."

The National Association of Cotton Manufacturers and Planters, after a survey of the whole ground, and in possession af the whole of the statistics since acquired, make the total production of cotton for 1868-'9, - - - - - - - - - - 2,366,467

The *Courier's* statement, as made up on the 14th of September, makes the total production, - - - - - - - - - - - - - - 2,358,369

A difference of - - - - - - - - - - - - - - - 8,098

It thus appears that the *Courier's* statement came within 8,000 bales of the actual result, thus vindicating the accuracy of our estimate and of the basis upon which it was formed.

THE COTTON CROP.

The *Shipping List* has made up its annual tables of the cotton crop, and we use its figures in our annual compilation, as it has passed for many years for standard authority on this theme. It gives the total of the last crop at 2,260,557 bales, being 107,336 below the corresponding total for the previous year. In our last annual review we said, "We cannot think the yield, as a whole, will fall much, if any, below the production of the last year." The difference is not very great, but the total is considerably below the popular estimate at the date referred to, some believing that the crop would exceed two and a half million bales. We now present the yield from different sections, with a comparison from our records of the same in former years:

COMPARATIVE PRODUCT OF COTTON.

	1865–7.	1867–8.	1868–9.
Louisiana	702,131	578,231	794,205
Alabama	239,516	366,193	230,726
Texas	185,919	114,666	147,817
Florida	58,349	34,639	13,392
Georgia	255,965	405,005	357,253
South Carolina	162,247	240,225	198,943
North Carolina	38,522	38,587	35,912
Virginia	123,627	187,487	160,418
Tennessee, &c	185,712	374,860	321,891
Total bales	1,951,998	2,430,893	2,260,557

The total exports to foreign ports for the year show a decrease of 208,173 bales, distributed as follows:

	1866-7.	1867-8.	1868-9
To Great Britain	1,216,262	1,228,596	989,500
To France	198,147	197,515	224,527
To N. Europe	95,342	145,042	177,182
To other ports	47,303	84,663	56,434
Total bales	1,557,054	1,655,816	1,447,643

The total consumed in the United States, including all burnt at the ports, is given at 995,127 bales, being the largest aggregate on the record.

In regard to the growing crop there is the usual difference of opinion. The season has been unusually propitious in every respect but one—it is a week or ten days late. The growth is vigorous, the bolls are large and thickly set, and only the fear that the frost may not hold off to allow compensation for the late spring prevents our estimate exceeding three million bales. Our own opinion, after a careful comparison of a large correspondence sent us from all parts of the cotton field, is fixed upon the interval between two and three-quarters and three million bales. The present indications are that the yield will be nearly, if not quite, the higher amount.—*Journal of Commerce.*

LITTLE SUGAR FARMS AND WHITE LABOR.

The theory of little farms and white labor in the sugar regions of Louisiana has this year been settled, in many instances, in favor of the Banner theory. The facts we give below may be relied upon. We vouch for them in every particular. We are well acquainted with the man and the circumstances.

Mr. E. Meynard, a native of Louisiana, and raised in St. Mary, has a small place rented at Charenton, nine miles from this place. He is a white man, and an estimable citizen.

He planted and cultivated forty-five arpents of land last season—twenty-two arpents of cane, fifteen of corn, and the balance in rice, Irish potatoes and sweet potatoes. He hired another white man six months, and paid him ninety dollars. During the cultivating season he hired negroes for a few days occasionally. His labor, white and black, in cultivating his entire crop, cost him just one hundred and forty-five dollars.

He sold Irish potatoes to the amount of one hundred and thirty-five dollars, and had enough left for his own use. He made ten or twelve barrels of rice, more than eighty barrels of sweet potatoes, saved hay and fodder for his own use, and corn enough for the place.

A planter, four miles distant, has ground up the crop for fifteen hogsheads of sugar, taking the cane from the field. He grinds twenty arpents, and has made forty-five hogsheads of sugar, and about sixty barrels of molasses. Mr. Meynard has put up two arpents of cane for seed. His proceeds of the crop of cane is thirty hogsheads of sugar, and about forty barrels of molasses.

FRUITS OF THE LABOR OF MR. MEYNARD.

First, he makes a supply of sugar, molasses, corn, potatoes, hay, etc., for his own family one year. Next,

30 hhds. of sugar, $120	$3,600
40 bbls. molasses	800
Irish potatoes sold at	135
Rice, sweet potatoes and other products	50
	$4,585

Mr. Meynard served with credit to himself in the Confederate army during the war, came home with no money, and nothing but his labor to go back on, and here are the results.

To other white men, similarly situated, we would say, "Go thou and do likewise, and you will have a like reward."

ANOTHER CASE.

Another white citizen of St. Mary, a native of this parish, was out of money, but by a little help from a friend he put up a small sugar house and mill, hired three negroes, made a full hand himself at the plow and hoe, and is crippled in one hand.

The proceeds of the crop will pay all of his expenses of labor and putting up his sugar house and improvements, and he will have some money left.

THE COFFEE TRADE.

Brazil is the greatest producer of coffee. That known in trade as Rio is a Brazilian coffee. Of the 713,000,000 pounds produced by the world per annum, Brazil furnishes 400,000,000, or more than half of the whole; Java 140,000,000; Ceylon 40,000,000; St. Domingo 40,000,000; Cuba and Porto Rico 2,500,000; Venezuela 25,000,000, Sumatra 25,000,000; all others, including the Mocha, 18,000,000. The United States is the greatest consumer. We use in the United States nearly one-third of all the coffee consumed in the world, using nearly seven times as much as Great Britain, with a population not very far from the same. Germany comes next.

EDITORIAL.

OUR NEW YEAR.—With this number begins a new volume of this standard Southern work. It claims no merit for having stood by and participated in all the vicissitudes which have marked the fortunes of that section, of which it claims to be one of the organs. When the South had need of all the counsel and encouragement of her sons, the REVIEW was in duty and in destiny bound to the land and the home of its birth. Responsible for the principles it had taught, it was willing to wait and have that responsibility and, if necessary, to perish with the misfortunes it could not avert. The patrons of the REVIEW will bear witness that it has made no appeal to their charities. It offered no complaint of any difficulty which might attend its publication. With a knowledge of the wide-spread suffering throughout the land, it was not decorous to obtrude any special interest upon general attention. The noble approbation of the Southern press, the respectful appreciation of the Northern press, the generous patronage and the personal friendships which have aided and encouraged the editor, during the past year, would have rewarded him a thousand-fold for any labor or responsibility he has been called on to meet.

As, however, the REVIEW has committed itself to the fortunes of its countrymen when they were most gloomy, it is a grateful dispensation of Providence that it should have shared the general restoration of their prosperity. The patronage of the REVIEW was so substantial, and the evidences of its value so satisfactory as to induce the formation of a SOUTHERN PUBLISHING COMPANY, which is domiciled in New Orleans. The editor of the REVIEW has been honored with appointment as President of the company, while the ample means and mechanical resources of the company will insure an early, accurate and

elegant issue of the monthly numbers. This will enable the editor to bestow his time entirely on the editorial conduct and correspondence of the REVIEW, whose friends and patrons are thus assured of its permanence and prosperity. Under these circumstances the REVIEW pursues with unabated perseverance the principles to which its services have been for nearly thirty years dedicated. Thoroughly convinced that all the States of the Union should be respectable and respected, as those of New York, Pennsylvania, Ohio, Illinois and Massachusetts, the REVIEW is not discouraged by the failure of the Southern States to assert an equal position. It seeks to accomplish the same object by other and pacific means. It seeks to attain this object through the instrumentality of means which the REVIEW has always taught, and to which the Federal constitution can under no construction make objection. The means to which we refer are the practical education of our youth to all the scientific pursuits and industrial arts; the organization of foreign and domestic commerce with manufactures, and all the industrial occupations employed by civilization; the encouragement of immigration from all the nations of Europe and from all the States of the Union; the commercial expansion of the United States to all the ports of the American continent; the honorable and scrupulous maintenance of every political and individual pledge given for maintenance of the Federal Union.

The editor is aware that a large and patriotic class of Southern statesmen relied upon the evidences of history and tradition, and the fraternity of a common struggle for independence, to establish a correct construction of the Federal constitution. It was thought party organization, based upon the proclamation of these principles, would have insured their adoption. While these statesmen were ready to acknowledge the value of commercial intercourse and industrial progress, there was an apprehension that the labor and local systems of the South might be endangered by their introduction. While we accord to those statesmen entire sincerity in their fears for the security of the South, it is perfectly plain that the changes wrought by the war involve a change in the industrial policy of the South. Such seems to be the opinion of men most eminent for their action in the late war. General Lee, General Hampton, Commodore Maury, General Forrest and a host of others are commending to the Southern people abstinence from political agitation; the abandonment of hope from political intervention; the education of Southern youth to the practical application of science to the arts of industry; the development of agriculture by improved machinery and fertilizers; the development of internal and foreign commerce by railroad and steamship enterprises. Such are the doctrines of a school of Southern patriots, who by no means despair of restoring the prosperity and influence of the Southern States.

We do not admit the doctrine taught by the classic poet, that, as times change, we should change with them, that we may thereby court the smiles of power, or receive the reward of servility. But when the true theory of the government has been overthrown, it is our duty to arm ourselves with all the means of material power which are alone recognized by that change. Has not the constitution of the country been overthrown? The result of the war has extinguished both the constitutional parties who were coeval with the constitution, and whose conflicts of opinion alone occasioned the war. A new theory of government has been inaugurated. The Federalist of old relied on a judicial exposition of the Federal constitution. He would have armed the Executive with the power to execute the decree of the courts with the sword. The State Rights party claimed for the States the right to construe their own compact, each for itself, in the last resort. The Republican reformers have sternly strode to supremacy over the wreck of both these parties. The rights of the States to construe their own compact has been annulled by the unconditional capitulation of armies and of States. The representative department has subjugated and gagged the Federal judiciary. The Federal Executive has acknowledged its obligation to execute the will of the majority, as signified through their representa-

tives. The government of the United States is now in effect a government of numbers. It only remains to conform the Federal Senate to the theory of the equality of every human integer to make the numeral consolidation complete. Every vestige of Statehood will have been obliterated. The once sovereign States will be degraded into municipalities, and, in the words of an eminent Republican leader, the States will be but "counties in the Union." Under this obvious and inevitable state of circumstances, to enable a State to maintain even its influence as a municipal community in the Union, it will be necessary that it shall pursue the policy already intimated. It must proceed to acquire all those elements of Federal power which are alone recognized *now* in the administration of the Federal government. These are: the acquisition of representative numbers, the accumulation of capitalized wealth, the organization of all the mechanical and commercial agencies which attract and retain population, and which make the contributing of each State to the common treasury, or the supply of the military quota to the common defense, a consideration worthy of being respected.

Very far from being discouraged by the failure to secure a recognition of the principles by the fortunes of war, the REVIEW deems it even possible that the war may have cleared away obstacles to their future adoption. The South has no longer to stand guard over a powder magazine and forbid smoking on the premises. There is no longer a black line drawn around the South, as if it deserved to be expunged from the map of civilization. Sooner or later the relations between the white people and those who are everywhere the laborers and menials of the whites will be kindly and cordial. Good masters and good servants will get together, and both will be down on bad servants or unjust employers. The young men of the South, educated to all the enterprises of the age, will develop all the powers which nature has so trusted to the Southern people. If then the government is a pure democracy, the South will possess all the elements which entitle it to consideration in a democracy. If it shall ever return to a confederation of equal sovereignty, the Southern States may proudly take their station as the equal of the most powerful.

With these views and with these prospects, DE BOW'S NEW ORLEANS REVIEW embarks anew on the track, from which neither storm or calm have for a moment diverted it, hoping that the motives which animate it may ensure its success.

NEW ORLEANS, January, 1870

DEBOW'S
SOUTHERN AND WESTERN BUSINESS DIRECTORY.

INDEX.

CITY OF LOUISVILLE, KY.

Birds eye view from Shelby St. to 18th St.

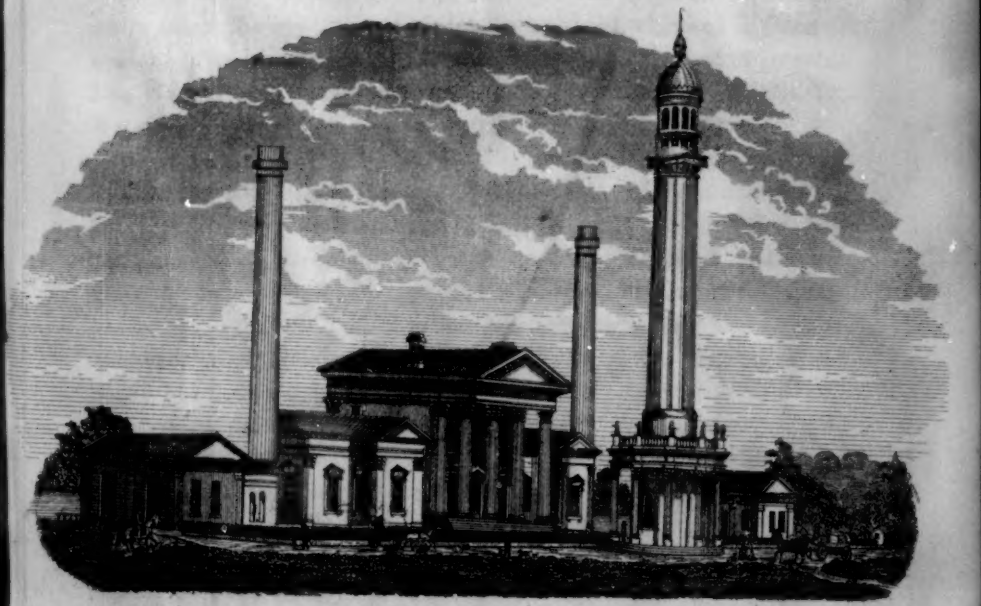
Engraved for De Bovs Review Southern Publishing Co. Publishers.

A. FINK, Chf. Engineer. Length of Bridge 5280 ft. Width of Roadway for Railroad, Wagon & Footways 25ft. F. W. VAUGHAN, Asst. Engineer.

27 Spans of varying widths. LOUISVILLE, KY. Elevation of floor above high water 46 feet.

THE GREAT IRON RAILROAD BRIDGE.

Engraved for De Bovs Review Southern Publishing Co. Publishers.



LOUISVILLE WATER WORKS ENGINE DEPARTMENT

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